GAS JOURNAL, OCT. 25, 1939

VOL. 228 91st YEAR No. 3988

Editorial Notes

100% Gas

THE announcement of the Government in regard to the rationing of gas—and the announcement applies also to electricity—is welcome, though not at all surprising. Originally the rationing scheme required a limitation to 75% of last year's consumption. The rationing figure has now been raised to 100%. In other words, for the time being any consumer is allowed to use as much gas in any period as in the corresponding period of last year. This decision follows an interim arrangement whereby prepayment consumers were exempted from any rationing, and the decision is one of common logic. It eliminates a great deal of unnecessary, confusing, cumbersome—and, maybe, impracticable—procedure. We say "unnecessary," because the war has made it encumbent on everybody to economize in his or her domestic heating and lighting requirements; there simply is no alternative, and the Government need have no fear that rigid economy in this respect, which it urges, will not be exercised. Consumers are in fact rationing themselves voluntarily, and the nightly blackout alone has considerably restricted consumption of both gas and electricity.

Rationing still exists, and the former provisions relating to the consumption of coal remain unchanged. It may at some future time be found necessary to modify the 100% gas and electricity figure—though we doubt very much whether this will be found necessary, and especially in the case of gas. As we pointed out in the "JOURNAL" last week, a given quantity of energy in the form of electricity employed usefully for domestic heating represents the expenditure of over 1.7 times as much coal as is required for the same quantity of energy in the form of gas usefully employed—and we pointed this out in no attitude of carping or competitive criticism. Again, the Government was, on the one hand, calling for an increase to the maximum of raw materials from the Gas Industry for the manufacture of explosives and of other essentials, such as antiseptics and fertilizers, for the prosecution of war, and on the other hand it was simultaneously restricting the use, and therefore the manufacture, of the gas and other products of the carbonization process from which these materials are obtainable. It was rather absurd to set a drastic limit to the use of gas when the country is in need of benzole and toluole, the chemicals derivable from tar, and sulphate of ammonia for agriculture.

The Government is retaining the rationing scheme in its modified form—a form which will, however, bring relief to gas consumers and, we suggest, all-round benefit to the national economic structure. The Government states that it cannot neglect the possibility that, as a result of enemy action, there might be serious dislocation of our transport system. Hence, it says, the need for maintaining machinery which could quickly reduce coal consumption.

In penning this note on the new and modified rationing scheme for gas and electricity, we may well quote an excerpt from a leader in *The Times* of October 21: "Perhaps the householder will wonder why the coal ration is maintained while the consumption of gas and electricity is restored to the normal. The answer is simple. Industry generally, and the munition makers especially, require very large supplies, and it is Britain's duty also to be sure that France shall have all the coal she needs. In addition the export of coal in increasing quantities is of the highest importance. The sale of coal in neutral markets is a means of supplying this country with urgently needed foreign exchange, and there are openings for British coal in the markets which German and Polish coal can no longer reach. If the output of the mines is increased by 30,000,000 or 40,000,000 tons a year there will still be need for limiting household supplies in order that exports may be kept high. By this much self-denial (coming a long way short of hardship) the householder is making his contribution to the economic strategy of the war."

Gas Supply and Air Attack

EXAGGERATED fears are on occasion expressed by the public regarding the dangers of explosions at gas-works and on the district as a result of enemy attack from the air. Some are particularly apprehensive of what would happen should a bomb fall on a gasholder. Widespread fears in this regard are unfounded, and it is salutary to turn to the Transactions of The Institution of Gas Engineers for 1918-19 and recall the experiences of British gas undertakings during the Great War

as recorded in a Paper presented to the Institution by Mr. H. Townsend. In that Paper the damage to gas undertakings from 1914 to 1918 due to aerial attack and enemy bombardment was reviewed in some detail.

During that period there were at least 25 air raids over London, and, of course, many other towns received these unwelcome visits. Actually, Ramsgate received no fewer than 119 air raid warnings. Only three instances, however, are recorded of direct hits by bombs on gasholders. In one case two bombs dropped on the gas-works, one striking the edge of a holder which was at the time quite full of gas (135,000 cu.ft.), making a large hole in the sheeting. Splinters from this bomb also caused considerable damage to a small gasholder, while a third holder, which was also full (210,000 cu.ft.), was perforated in 300 places by the other bomb. The gas of all three holders ignited and burnt out. No explosion occurred. Two incendiary bombs dropped on another gas-works, one of which fell on a small gasholder, passing through the crown into the water tank below. The gas was not even ignited. In the third case two bombs also dropped on the works. One of the holders received 110 perforations and another some 10 perforations from flying fragments of the bomb. No fire seems to have occurred.

Considerable damage to gasholders is also recorded at two coastal towns through bombardment from enemy warships. In the one instance two of the holders sustained direct hits from shells and the gas in the holders was ignited. In the other two instances holders also were struck by high explosive shells and the gas was ignited. In neither case, however, did any gas explosion occur.

Having reviewed the many reports of damage to gas-works throughout the country, the Paper concluded: " The foregoing particulars prove conclusively how safe gas-works really are. Numerous gasholders have been destroyed by enemy shells, by bombs from hostile aircraft, and by explosions at adjacent munition works; but in every case the gas contained in them has either escaped harmlessly into the air or has quietly burnt itself out. In the case of the Silvertown disaster, no less than 8 million cu.ft. were fired, and London lit up by the blaze; but there was no explosion or damage done except to the gasholder itself. This should surely remove the long-existing prejudice of the public, and show them how groundless their apprehensions are."

Whatever aerial attacks we may experience during present hostilities it seems clear from past experience that risk of gas explosions due to aerial bombardment of gas-works is very remote. And in not a single instance where gas mains charged at low pressure were destroyed by shells or bombs did any explosion occur—and this, wrote Mr. Townsend, should reassure the public mind and prove that the distributing mains on the district are as safe as the gasholders at the works.

The foregoing excerpts from this Institution Paper should be of help to the personnel of the Gas Industry in allaying the fears of the unduly timid; and the latter would be doubly reassured did they know of the elaborate precautionary measures taken by the gas undertakings in this country to minimize the dangers from attack by air and to ensure continuity of a vital public service.

Street Lighting

WE have a complete blackout, so why think about street lighting for the time being? The fact is that the problems of the blackout have occasioned a great deal of thought since the outbreak of war, and in the many deliberations—they have been continuous—the Gas Industry has not been idle. At the moment it is not opportune to discuss in detail the work, much of it experimental, which has already been done and is in being. We can, however, assure readers that a great deal has been accomplished at any rate to shed the light of knowledge on the subject, if not as yet to shed a measure of light on the streets. The complete blackout has provided a unique experience for the study of the peculiar problems it presented; and whatever the grumbles concerning it, it is certain that, without it, developments for its possible ultimate alleviation would not have been so well founded and securely based. There would, in brief, have been fewer grounds for optimism in regard to street lighting in general, and affairs would have been more haphazard than in fact they are.

Some of these developments have been made known; others, for understandable reasons, have not. But investigations under closely observed conditions have been and are being carried out. Among the developments which have been made public we may mention in particular the provision of units for low intensity illumination of the order ranging from 0.002 to 0.2 foot-candles. Specifications for these units—the specifications are, of course, subject to revision—have been published by the British Standards Institution, and in their preparation the Gas Industry—in which we include the manufacturers of gas lighting equipment—has played its part. These specifications are the outcome of the much to be commended co-operation between the Illuminating Engineering Society and the British Standards Institution.

The blackout is a depressing affair. It immobilizes movement and it detracts from that very desirable feeling of human companionship in the streets. It has resulted in many accidents and has brought in its train other problems—such, for example, the adequate provision of educational facilities for the younger workers. We are assured, however, that the importance of these problems and difficulties is recognized in official circles, and that they are being fully considered and investigated with the aim of arriving at a possible and workable solution.

The experience of the blackout has brought a new focus to bear on these special problems, and we are of opinion that expectations have been exceeded of the possible use of illumination units of the order of 0.002 foot-candles—that as a result of investigation there is more optimism regarding their application than when the units were first designed. And, as we have said, experience of the peculiar conditions of complete blackout have eliminated the element of chance in the application of such fittings. Correctly applied they will give predetermined results—and this is all-important. There must be no element of chance. Again, it has been possible to view from an entirely new angle the relative merits of blue and white light, and one thing which has emerged is that blue light is much more expensive than white light. Its use would involve an extra expenditure of energy at a time when the call is for the conservation of national resources. Those responsible for decisions on future lighting would doubtless welcome a pronouncement on the virtues, if any, of blue lighting.

It is good to know that such problems are being investigated and that in the deliberations the Gas Industry is playing the part which its importance in supplying in peace-time illumination for our streets merits. And apart from street lighting, there is the lighting of our shops and other business premises so that regulations can be complied with while carrying on business under conditions of black-out. A specification for simple yet effective light traps for doorways has been issued by the B.S.I., and much other informative work is in progress which will have its result in alleviating the effects of Stygian darkness in the streets. There is no doubt that, should a partial rather than a complete black-out be thought worthy at any rate of trial, the Gas Industry, through its experimental work and its representation on responsible and expert committees and bodies, will be in a position to offer not only advice, but also the necessary equipment to fulfil with exactitude the requirements which will have to be met.

Keeping the Home Fires Burning

"BUSINESS as usual during alterations to the map of Europe" was a familiar sign in the windows of enterprising shopkeepers in the early days of the Great War, and although the slogan may not have been carried out to the letter it was, as far as possible, observed in the spirit. Between the optimists who imagine that business can be continued without any interruption at all during the present conflict and the pessimists who fold their arms and declare that the business world is inevitably coming to an end there are those who mingle their confidence in the stability of the structure with a certain amount of misgiving. In no direction is this more evident than in the selling of gas appliances. Only inveterate optimists would tell us that the present is an appropriate time to start a campaign to sell millions of new appliances, but is there even as much wisdom in the idea that all such sales should be entirely suspended "for the duration"?

It has always been recognized that gas service has meant primarily the sale of gas, and that the selling of appliances has been a means to that end. Assuming that gas rationing in some form—either by law or by reason of the restricted spending power of the consumer—continues as a permanent feature of the war, the inducement to sell more gas automatically disappears and the salesman who fails to appreciate the need for continued appliance sales has, at any rate, a certain amount of ground for his attitude in the light of all he has been taught in the past about the relationship between the selling of gas and the installation of equipment. Unless the whole structure of gas service is to fall into decay, however, there must be a steady stream of replacement, and if we are not to ignore entirely all that has been done by way of improved efficiency, there is bound to be a call for apparatus that will enable the consumer to derive the largest measure of value from the decreased volume of gas he is able to use. From the point of view of the gas undertakings themselves, therefore, there is good reason for disabusing the public mind of any idea that the showroom side of the business has closed down for the period of the war, and for continuing, and even pushing, the sale of new and improved appliances, not only for the good of the Industry but for the maintenance of goodwill on the part of the consumer.

The manager of the small undertaking, beset with all the problems that war has brought upon him with regard to the suspension of public lighting, the rationing of gas, the blacking out of the showroom window, and the consciousness of reduced spending power among his consumers may see little prospect of selling anything, but even in these depressing circumstances there exists the possibility that somebody will want to replace an extravagant appliance with something more economical. The urge to sell appliances which comes to the undertaking in these days in a reception area will be shared only to a limited extent in the neutral zone, where, apart from the war Budget and other minor troubles life goes on very much as if nothing unusual were happening on the Continent, while the evacuated area will appear to be a kind of No Man's Land. But even here the door is not shut on the possibility of putting in new, more economical, and perhaps smaller apparatus to meet the new circumstances of those whose households are depleted and who want to discover how to make a little gas go a long way. If hire purchase becomes impracticable there still remain the alternatives of simple hire and cash sales, either of which will help the consumer and enable the Industry to maintain a tradition built up as the result of many years of persevering work. No one expects sales of appliances throughout the country to be maintained at the full peace time level, but if a reasonable sales policy, based on the long-range requirements of gas service, can be pursued it will contribute substantially to the keeping intact of the Industry.

Nor must it be forgotten that the appliance manufacturers, no less than the supply undertakings, are an essential part of the Gas Industry, and that if, through resort to a too short-sighted policy, the manufacturing side were allowed to become impaired during the period of conflict, the Industry would be seriously handicapped in meeting the new conditions that will arise on the return to normal times. We give place to none in our eagerness to help the nation towards a speedy victory for our cause, and we realize that many manufacturers will conceive it to be their duty to change over from peace to war-time production. There are probably many who have little or no choice in the matter, but even in the case of those who are free to choose there is a stern conflict between the tempting bait of war work and the pursuit of normal business which must inevitably fall, however slightly, below the peace time average. Now is not the time to criticize those who deem it proper to turn part of their attention to what may be termed priority work, but the ultimate return of peace conditions must not be completely ruled out. Apart from those to whom the call of patriotism comes there are some who are disposed to take the view that no matter how long or short the war may be no new appliances will be wanted until Hitlerism has been defeated.

Several firms are so inundated with orders for gas appliances for Government defence departments that they see no possibility of meeting the limited demands of the Gas Industry, and some of them are consequently not at present in favour of continued sales; but it needs very little imagination to devise some kind of co-operative effort in order that priority work may be fitted into the general programme without completely stifling the normal—and, when peace returns, the essential—output of apparatus. There are other manufacturers, particularly those making a fairly high-priced product, who dismiss the possibility of effecting any normal sales, and

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(Telephone: Esher 1142)

Will our subscribers, advertisers, and correspondents kindly note this new address, as from Monday next, Oct. 30, for the "GAS JOURNAL," the "GAS SALESMAN," and allied publications, in lieu of Cluny Lodge, Esher, and accept our apologies for troubling them to register the change? The temporary premises to which we evacuated our records and most of our staff at the outbreak of war are proving inadequate for the considerably increased volume of business which is now passing.

WALTER KING, LIMITED.

instead of placing production on a reduced basis contemplate cutting it out entirely and changing over to the production of war material. Are they not overlooking the fact that if they want to recover their market later on they will have to make an entirely fresh start?

Some of the larger manufacturers have anticipated the present situation by applying their research and technical skill to the problems of maintaining their business in spite of difficulties, of changing over from materials of construction which may become scarce, or even unobtainable, to others equally or very little less suitable for the particular work in hand, and who can in consequence offer the Gas Industry a service entirely adequate to the restricted needs of the times. We do not, and never have, doubted the determination or the ability of the Industry to "carry on," but it is pertinent to ask whether those undertakings that may be a little less enterprising than others are prepared to pull their weight in taking advantage of that foresight to which we have just referred and maintain a sales policy adequate to the times in which we are living.

Looking at the question from the point of view of the manufacturers it is conceivable that if the war lasts three years those who are so short-sighted as to drop manufacture completely will be three years in arrear with their development work and will have to make a new start from scratch when peace comes. Those who allow their lack of confidence to reduce their activities by half will be eighteen months behind, with a great deal of leeway to recover, while those who keep their development work going and sell appliances while people still have the money to buy them will be fully ready for the resumption of peace time enterprise.

To sum up, it behoves the manufacturers to continue to make, and the gas undertakings to continue to sell, as many appliances as can usefully be put into service, for "without vision the people perish" and without appliances no gas can be sold.

Coke for Motor Transport

MANY times during recent years the "JOURNAL" has suggested that the Gas Industry should investigate the possibilities of producing reactive coke suitable for use in producers designed for motor transport. In September of 1937, for example, we remarked that it might be found possible by research to use gas coke in the generator of the producer-gas driven vehicle. "If not," we went on, "it might be possible to activate gas coke for the purpose; and even if that were impossible, it is conceivable that the production of gas in a process that provides a suitable semi-coke might be feasible." Work has been done on the production of reactive cokes, and there is plenty of information available, but can it be said that the Gas Industry as a whole has sought to connect this work with the supply of coke for motor transport? In peace-time the possibilities were there. Now we are at war the question assumes far greater importance, and the Industry should give it its closest attention.

The ideal fuel for producer-gas driven vehicles would, as set out by Dr. J. G. King in the William Young Memorial Lecture which he gave to the North British Association two years ago, have the characteristics of (1) high reactivity to give a low fuel bed temperature and a high CO/CO_2 ratio; (2) no tar or vapour on gasification; (3) close grading, say, 1 in. to ½ in. size; (4) a type of ash which would give no clinker troubles. At the time, Dr. King remarked: "Characteristics (3) and (4) present no real difficulties, and it remains to discover whether the Gas Industry could manufacture, without undue cost, a reactive coke of sufficiently low volatile matter, free from potential tar, to satisfy requirements." Since then we have had the results of the investigation carried out jointly by the Edinburgh Gas Department and the Fuel Research Board on the production of free-burning coke in continuous vertical retorts. These results were given at the Autumn Research Meeting of The Institution of Gas Engineers last year, and further work is in progress at the Fuel Research Station. The coals chosen for the Edinburgh experiments were specially selected Scottish coals, and the object was to produce smokeless fuels for domestic purposes. The results were entirely satisfactory, and it would seem that they constitute a good basis for investigation into the production of fuel for producer-gas driven vehicles.

It would seem that no fuel with a C.A.B. test value of over 0.045 would be suitable for traction producers. But the C.A.B. value of gas coke can be brought down from the region of 0.06 to 0.07 to the required level both by activation with alkali and by the method outlined by Mr. Jamieson and Dr. King and that practised at Liverpool in the manufacture of "Dryco." Dr. C. H. Noton, of the London and Counties Coke Association, recently described his experience of travelling in a producer-gas driven 3 ton lorry using coke activated with ¼% (5 lb. to the ton) of sodium carbonate. Gas was got up from cold in less than five minutes, and the lorry showed a fine turn of speed. Surely now is the time for the Gas Industry to co-operate with the other bodies interested in the development of producer-gas driven vehicles. It should not prove a difficult task for the Industry to supply fuel meeting the requirements of the producer-gas vehicle as regards coke analysis, reactivity, and size.

Gas for Motor Transport

The Mines Department has announced that the Government does not at present intend to ration coal gas as fuel for motor-vehicles. It is not proposed either to prohibit flexible containers for gas from being carried on the roofs of motor vehicles or on trailers; and no special restrictions are likely to be imposed on the use of gas in steel cylinders beyond those already enforced on grounds of safety.

We are given to understand that, pending an official statement of this kind, many motorists have hesitated to have their cars especially fitted for the use of gas, as they feared that the Government might decide to restrict the supply of gas as a motor fuel. They now need have no fears on this ground.

Letter to the Editor

Coke Oven Gas Rationing

SIR,—While I congratulate the coke oven industry on obtaining the concession with regard to gas rationing (which I hope will have the effect of giving the legitimate Gas Industry the same relief), I would point out that as far as the average coke oven is concerned, they have created a surplus of coke to the detriment of our coke market, and then started to complain because gas is going to waste.

The legitimate Gas Industry could quite easily make a surplus of gas and blow it to waste and then appeal for the same consideration. I suggest that the coke oven industry should cut its garments according to its cloth and only manufacture such gas as is required.

I think they would be the first to agree that there is plenty of surplus coke in the country at the present time without making more than is necessary, and I would quote from the article in your current issue where you say "Coke Oven owners have been asked to maintain and as far as practicable increase, their output of foundry coke, benzole, tar, antiseptics, &c." I do not recollect the legitimate Gas Industry having been called upon similarly, and having regard to the reduced sales due to the abolition of street lighting, there is a considerable reduction in the amount of benzole and coke produced and consequently no need for rationing, if the Government really do want benzole and toluole.

Yours, &c.,
C. S. SHAPLEY,
Engineer and General Manager.

Leeds Gas Department,
Market Hall, Leeds, 2.
Oct. 19, 1939.

Forthcoming Engagements

Oct.

26.—S.B.G.I.—Meeting of Emergency Committee, Banbury, 2 p.m.

26.—Wales and Mon. Association.—Annual Meeting at Cardiff.

27.—Coke Oven Managers' Association.—Annual Meeting, Royal Station Hotel, York, 11.45 a.m.

Nov.

14.—N.G.C.—Central Executive Board Meeting, 11 a.m.

Personal

Dr. Harold Hartley

Dr. Harold Hartley, Head of the Research Section of Radiation, Ltd., has been appointed to that Company's Board as Technical Director.

Dr. Harold Hartley's association with the Gas Industry dates from 1909, when he was elected to the Gas Research Fellowship at Leeds University, on the recommendation of the late Professor Bone, the first Livesey Professor.

Entering Manchester University in 1904, he had studied under Professors Dixon, Perkin, and Bone, during a period of great research activity of the famous Manchester School. Graduating in 1907 with First-Class Honours at the head of his year, he was elected to a Gartside Scholarship of Industry and Commerce. After a year's work in the School of Economics, he travelled in Norway and Canada, collating data on the cost of power production for electro-chemical industries. While in Canada, Dr. Hartley carried out research work at MacGill University.

On returning to this country, he was offered the Fellowship at Leeds by Professor Bone, and thus started a close friendship, which lasted until the latter's death last year.

In 1912, at the suggestion of the late Mr. H. M. Thornton, Dr. Hartley was appointed to the staff of the Richmonds Gas Stove organization at Warrington, to build up a Research Section. His first Communication to The Institution of Gas Engineers was read at the Liverpool Meeting in 1914, during the Presidency of the late Edward Allen, and dealt with a portion of the work which had been done during the tenure of the Gas Research Fellowship. The appointment of Dr. Hartley to the position of Chief Chemist to the Radiation group at its inception was an indication of the success of the work which had been done in the Warrington Laboratories.

In 1922, when Radiation House was opened in Grosvenor Place, Dr. Hartley moved to London.

In 1925, the Research Laboratories at Radiation House, London, were opened by Sir David Milne-Watson, and there followed a period of activity which has led to marked development in gas apparatus.

In 1937, the new and enlarged Laboratories were erected in Birmingham, and reference to their design and equipment was made in our columns recently. To-day the members of the Radiation Research Staff from London are at Radiation House, Aston, together with the staffs already installed there.

Dr. Hartley is a Member of the Research Executive and Joint Research Committees of The Institution of Gas Engineers, and is one of the representatives appointed by the S.B.G.I. to the Council of the recently-formed Gas Research Board.

For several years Dr. Hartley has been an active Member of the British Cast Iron Research Association, one of the most successful of the research organizations sponsored by the D.S.I.R. He has served as a Member of Council and Chairman of the Research Committee, and latterly as Chairman of the Council.

The removal of his headquarters to Birmingham, where are situated the Laboratories of the B.C.I.R.A., will ensure even greater co-operation than before between Radiation, Ltd., and the Association, and should prove of mutual benefit and service.

W. J. Sandeman

At the end of this year Mr. W. J. SANDEMAN is retiring from the General Managership of the Croydon Gas Company, when it is intended that he shall take a seat on the Board of Directors.

After a few years with the Brighton Gas Company, Mr. Sandeman joined the Croydon Company in 1904 as Distribution Superintendent. In 1913 he became Distribution Engineer and Sales Manager, and in 1927 he was appointed General Manager.

Mr. Sandeman was elected Chairman of the Executive Committee of the British Commercial Gas Association for the year 1938. He has been a member of the Executive Committee since its inception. He was elected Honorary Treasurer of the Association in 1927 and Executive Vice-Chairman in 1929. Mr. Sandeman has contributed several Papers at Gas Industry conferences, his latest being to The Institution of Gas Engineers at the June meeting last year, when he outlined the methods adopted by the Croydon Gas Company to deal with distribution and sales. In 1937 Mr. Sandeman was appointed a Justice of the Peace for the County Borough of Croydon.

Mr. Sandeman is being succeeded in the position of General Manager of the Croydon Company by Mr. WALTER GROGONO, who is at present Engineer of the Company.

Bristol Appointments

Following the death of Mr. S. E. Halliwell, who held the position of Secretary and Commercial Manager, the Directors of the Bristol Gas Company have made the undernoted appointments: General Manager—Mr. ROBERT ROBERTSON, M.Inst.C.E.; Secretary—Mr. GEORGE H. PALMER, A.C.A.; Asssistant Secretary—Mr. ALFRED S. MABY.

* * *

MR. LEOPOLD FRIEDMAN, Assistant Managing Director of Ascot Gas Water Heaters, Ltd., was appointed on the outbreak of war to the post of Deputy Depot Superintendent of the Gladstone Division of the Willesden Borough Council A.R.P. Organization. Since November, 1938, he has also been an Instructor (L.A.C.G.) in Anti-Gas Measures for the Middlesex County Council.

* * *

Mr. HARRY FRIEDMAN has been appointed assistant to Dr. Bernard Friedman, Managing Director and General Manager of Ascot Gas Water Heaters, Ltd., in the capacity of Assistant General Manager.

* * *

Mr. E. HARRISON, Manager of the Acklam and Newport coke ovens and by-product plants of Messrs. Dorman Long and Co., Ltd., has been elected President of the Northern Section of the Coke Oven Managers' Association.

Licence for Sale of Petroleum

Mines Department Announcement

The Secretary for Mines has made an Order entitled "The Petroleum (No. 2) Order, 1939," which requires that any person other than the Petroleum Board who sells wholesale in this country petroleum and petroleum products, including shale oil products and benzole, should obtain a licence from the Secretary for Mines. The Order came into force on Oct. 16, 1939.

In order to provide for the carrying on of the petroleum industry in a manner which best serves the interests of the nation in war time, the Petroleum Board, with the approval of H.M. Government, has been constituted by agreement between a majority of the companies engaged in the importation and distribution in this country of petroleum products, including benzole. There is a Committee of the Board which deals with lubricating oils. The Petroleum Board will work in close association with the Petroleum Department.

In order that the operations of those engaged in the wholesale trade in petroleum products and benzole, including those who are members of the Petroleum Board, may be fully co-ordinated, the Secretary for Mines has decided to introduce a licensing system under the above Order. All persons and companies affected by the Order should, therefore, apply to the Petroleum Department, Dean Stanley Street, Millbank, London, S.W.1, for a licence. The application should be in writing giving particulars of the petroleum products or benzole ordinarily dealt in by the person or company.

The list of petroleum products covered by the Order is as follows: Asphalt, bitumen, petroleum, coke, crude and process oils, Diesel oil, fuel oil, gas oil, greases, kerosene (including mineral vaporizing oil), lubricating oils, motor spirit (including aviation spirit), petroleum jelly, pitch, wax, white spirit, and other liquid products (including transformer oils and white oils) and includes also shale oil and the products of shale oil corresponding to the above descriptions of petroleum products.

Benzole is defined in the Order to include the following: Motor benzole, pure benzole, 90's benzole, industrial benzole, xyloles, coal tar naphtha.

Air Raid Precautions

The following British Standard Specification (A.R.P. Series) has been issued by the British Standards Institution at the request of the Air Raid Precautions Department of the Home Office: BS/ARP 6.—Shelter lighting (shelters for 50 persons or multiples thereof up to 200 persons). Revised edition.

Copies of the above Specification can be obtained (price 8d. each post free) from the Secretary, The Institution of Gas Engineers, 1, Grosvenor Place, London, S.W.1, or direct from the British Standards Institution, 28, Victoria Street, London, S.W.1.

News of the Week

Special Lamps to the number of about 2,000 have been ordered for the purpose of improving stair lighting in Paisley.

Married Employees of the Fleetwood Gas Company who are called up for service are to have an allowance made to their wives to bring service pay up to peace time wages.

In Order to Prevent Deterioration through lack of use during the war, the lamps normally used for illuminating the Burnley streets have been dismantled and brought into the store rooms of the Gas Department. The lamps are cleaned and painted before being stored.

The Scheme suggested by the North British Association of Gas Managers under which the whole resources of neighbouring gas undertakings would be made available to each other in the event of any undertaking being damaged by air attack has been approved by the Hamilton Town Council.

Tenement Stair Lighting reform in Glasgow is being delayed by the refusal of the Property Owners' and Factors' Association to accept responsibility for obscuring cupolas and skylights. More than 10,000 lights are being permitted on tenement stairs the windows of which have been obscured by owners.

A Great Deal of Interest has been created by the "all-gas" radio set, which has been operating in the vestibule of the Katharine Street Showrooms of the Croydon Gas Company. The news bulletins are regularly received on this set, and frequently a small crowd of passers-by congregate in the vestibule and on the steps, prompted both by their curiosity to hear the news and to inspect more closely this novel means of wireless reception.

War Restrictions, states Mr. J. D. Ashworth (Gas Engineer and Manager to the Blackburn Corporation) in a report to the Council, are not likely to have much effect in reducing gas consumption owing to the exemption of prepayment meter consumers, of which Blackburn has 26,000, representing two-thirds of the total. Also, a large percentage of the remainder are large consumers who do not come within the Order and other ordinary consumers below the regulation allowance of 100 therms per annum. He suggests that any increased charge should be on a basis of 15% on all scales except prepayment consumers, who should be charged to the nearest penny, which would then be 4s. 2d. per 1,000 cu.ft. against the present rate of 3s. 7d.

All Meter Repair Work is to be entrusted by the Dundee Corporation Gas Department to Messrs. George Wilson (Gas Meters), Ltd., who have lately opened branch works in the town. This new industry is bringing work from all over Scotland to Dundee.

Arrangements for Continuing the Supply of coke in small quantities to the poorer classes was made at a meeting of representatives of the Dundee Gas and Public Assistance Committees. It was decided that coke be sold at 3d. per bag of 28 lb. Hitherto it has been sold at 4d. for 56 lb.

In the Chancery Division on Monday Mr. Justice Crossman had before him a creditors' petition for the compulsory winding-up of London Thermostat Co., Ltd. Counsel announced that the parties had arrived at terms and by agreement the petition would be dismissed, without costs. His lordship directed accordingly.

The Effect of Increased Freights on sea-borne traffic has been taken up with the Mines Department by the Stornoway Town Council. The latter point out that the price of gas in Stornoway has already had to be raised by 5d. per 1,000 cu.ft. as a direct result of freight charges to Tarbert having been increased by 33⅓%.

Committee to Investigate and develop the production and utilization of methane gas as a fuel for motors has been formed in London. Its members include eminent men of science, politics, and industry. Mr. J. P. Lawrie and Mr. H. T. F. Rhodes are Hon. Secretaries, the offices of the Committee being at 35, Great James Street, W.C. 1.

The Price of Gas in Strabane has been increased by 3d. per 1,000 cu.ft. This brings the charge to slot consumers to 5s. 3d. The Gas Engineer and Manager (Mr. P. J. Rooney) observes that the increase is due solely to the war, and to nothing over which the Council has any control. Practically every house in town is fitted with gas. Many have started with electric light but are gradually coming back to gas.

Application is Being Made by the Liverpool Gas Company to the Board of Trade for authority to raise on mortgage or by the issue of debenture stock, any amount not exceeding the aggregate amount of the paid-up share capital of the undertaking; to modify the provisions of Section 29 of the Liverpool Gas Order, 1929, and to repeal or amend other provisions of the Liverpool Gas Acts and Orders, 1848 to 1934.

Gas and Electricity Rationing

After having examined the extent of the economy which has taken place in the use of gas and electricity as a result of the reduction of lighting due to the black-out, the Government has decided that it is possible to relax the rationing of these commodities.

The scheme now in force requires a limitation of the use of gas and electricity to 75% of last year's consumption, and a new Order will at once be made raising the rationing figure to 100%, thus permitting users to consume, when necessary, the same amount as last year.

It is necessary to keep the rationing machinery in operation to prevent excessive consumption and to enable a reduction of consumption to be secured by a revision of the rationing figure if, at a later stage, changed circumstances should necessitate it.

The Government has taken this decision in the light of the circumstances which have so far prevailed. It is, however, impossible to foresee what circumstances may arise in the future, and the Government wish to urge upon the public the great national importance of saving fuel and earnestly appeal to them voluntarily to prevent any unnecessary or wasteful use of gas and electricity.

New B.S. Specification

Copies of the following recently published British Standard Specifications can be obtained on application to the Secretary, The Institution of Gas Engineers, 1, Grosvenor Place, London, S.W.1, price 2s. each:

No. 210—1939. British Standard Classification of Lubricating Oils. (Revised, September, 1939.)

No. 879—1939. Definitions of Heat Insulating Terms and Methods of Determining Thermal Conductivity and Solar Reflectivity.

Motherwell Anniversary

The 90th anniversary of the Motherwell Gas Undertaking was attained early this month. On Oct. 7, 1849, a general meeting of the inhabitants of Motherwell was held at which it was agreed to establish a gas undertaking. At the first meeting of the Committee, a week later, it was agreed to erect a gas-works with a capital of £700. The Committee succeeded in raising £300, and the balance was borrowed. It was agreed to lease a site at Mill Road, where the works to-day are situated. In 1914 the works were transferred from the original Motherwell Gas Company for a sum of £136,648.

During the 65 years the works were run by the private company there were three managers—the late Mr. Andrew Reid (1849-58); the late Mr. John Fullarton (1858-1912); and Mr. Alexander Mackay (1912-14).

While the present is the 90th anniversary of the formation of the old Motherwell Gas Company, the silver jubilee of the town taking over the undertaking has also just been attained.

Manchester and District Juniors

After careful consideration, the Council of the Manchester and District Junior Gas Association have decided to cancel the programme which had been arranged for the Session 1939-40.

Mr. H. Platt (Bolton) has expressed his willingness to continue in office as President, and a small Executive Committee have been appointed to act during the present unsettled conditions, consisting of the President, President-Elect, Hon. Treasurer, and Hon. Secretary.

In a circular to members it is stated that it will be generally agreed that every endeavour should be made to continue the useful work of the Association, despite the present difficult times, and it is hoped that it will be possible to arrange for a meeting to be held in Manchester on Saturday afternoon, Jan. 27, 1940. At this meeting the President will open an informal discussion on "Problems and Difficulties arising from War Conditions," and members are urged to be prepared to take an active part in the discussion. Full details of the proposed meeting will be announced at a later date.

GAS HELPS TO CATER FOR 45,000 EVACUEES

As is well known, some towns have taken on a new aspect since the outbreak of war. One coastal town in the south became in the space of a few days the reception area for 45,000 evacuees under the Government evacuation scheme; and gas played a big part in the smooth running of the vast organization involved. We had the opportunity the other day of learning some remarkable facts and figures relative to the urgent installation work the gas undertaking of this town was called upon to perform.

"WE are expecting 500 children and their teachers at such and such a time. Can you arrange to put in gas appliances immediately to provide so many glasses of hot milk and so many cups of tea?"

Or again—

"This is the Medical Officer of Health's Department. We have taken over four houses and require three gas cookers, four wash-boilers, six fires, one L.55 refrigerator, and one hotplate. Can they be ready for use to-night?"

Such are typical examples of the questions which were fired at the undertaking in quick succession a few weeks ago when the town became, almost in the twinkling of an eye, the home of 45,000 evacuees—mostly schoolchildren—under the Government evacuation scheme. In each case the answer was in the affirmative—and the job was completed to time. Moreover, all this came on top of a large number of similar orders from many different A.R.P. and public service organizations, including public assistance, A.F.S., coast guards, emergency hospitals, decontamination centres, &c. Indeed, the total number of gas appliances which evacuation and general A.R.P. work have demanded amount, in round figures, to some four score cookers, 40 wash-boilers, 70 fires and radiators, 4 water heaters, 2 refrigerators, 5 coke grates, and a large number of smaller appliances, such as rings, hotplates, &c. In addition, a certain amount of large-scale equipment has been ordered for special catering, including roasting ovens, solid-top ranges, 20-gallon boiling pans, pressure steamers, large hotclosets, grillers, and toasters, while a number of showers have been fitted at two municipal decontamination centres.

How Was It Done?

It may well be asked how all this was done in so short a space of time. The answer is that the gas undertaking wisely anticipated the need for prompt action, with regard to the provision of both apparatus and labour. With this in view, the undertaking had for some time previously been accumulating a nucleus of comparatively large cooking apparatus and wash-boilers, realizing that arrangements for the temporary feeding of evacuees at dispersal centres would fall upon the municipal authorities—who, in turn, would look to the undertaking to assist by the loan of suitable apparatus.

It is apparent that while this temporary demand has been satisfactorily met, there will in all probability arise the need for communal feeding centres which will have to be provided by the municipal authorities to supplement the meals which the somewhat inadequate Government allowance will permit those responsible for billeting the children to provide. This will necessitate the installation of considerable numbers of large-scale catering apparatus in various canteen centres, rather than the hitherto temporary expedient of providing the means for warming foods and beverages between reception at the dispersal centres and despatch to individual billets.

The vast majority of evacuees have been accommodated by private families, whose existing gas apparatus has in practically every instance proved adequate. The only additional demand has been for small numbers of gas rings, hotplates, &c., which the undertaking has been able to supply immediately from stock. A considerable demand for gas appliances has, however, been received from schools, mission halls, and similar institutions which are receiving evacuees. Large untenanted houses were taken over by the municipal authorities for the reception of expectant mothers, and in such cases extensive gas installations had to be put in hand immediately and in most instances were completed on the same day as notification was received from the M.o.H. Such houses were also taken over for convalescent hospital cases.

Large numbers of gas appliances were also ordered for fire stations, both regular and A.F.S., other A.R.P. posts and centres, voluntary hospitals, drill halls, and billeting stations.

In the majority of these cases it was desired to rent the apparatus rather than to buy it. In the ordinary way, the gas undertaking does not make a practice of letting apparatus out on simple hire (with the exception of certain small domestic appliances); but in order to meet the exceptional circumstances which had arisen it was decided to hire out all appliances at a monthly rental equivalent to the usual hire-purchase instalment, and, where possible, to supply re-conditioned second-hand apparatus.

Cooker requirements, it was felt, would be satisfied in practically all instances by old large hire cookers, especially as the apparatus was required in many cases merely to augment existing cooking facilities. The hot water problem was effectively solved by ordinary 10-gallon wash-boilers. These latter appliances were also found eminently suitable for a variety of cooking purposes, such as for stews and boiled dishes—these making up a considerable proportion of the diet of the schoolchildren.

The provision of depots for destitute persons is another problem which is being faced, and here again the gas undertaking is being called upon to fix necessary apparatus; parish halls and large untenanted property are being designated for this purpose. Three centres for providing cheap meals for evacuees are being set up to supplement the existing W.V.S. scheme.

A Notable Achievement

Though the work is not yet fully completed, the undertaking can look back with no little pride upon an achievement which has contributed in no small measure to the smooth running of so extensive a scheme. Though it entailed, in more than one instance, working twenty-four hours a day, the undertaking and particularly, perhaps, the staff concerned may feel that they have played a vital part in this vast scheme of evacuation from the vulnerable areas.

In conclusion, it may be of interest to forecast so far as this is possible, the effect of this big influx of people on the consumption of gas. Until the rationing order became effective, there was an increase of 3%, while since then, in spite of the rationing, there has been only an infinitesimal falling off in output as compared with the corresponding period of last year. Of the total number of consumers 52,000 (or approximately 56%) have slot meters, while 43,500 are ordinary consumers subject to rationing. About 60% of the total consumption (equivalent to 1.800 million cu.ft. per annum) is subject to rationing. The evacuation scheme is, of course, having a considerable effect upon the rationing scheme, for all houses where billeting is taking place should be re-assessed, while other property taken over in connexion with the evacuation scheme will have to be subject to a special basis. The gas undertaking is assisting the Fuel Overseers by getting out a scale of consumptions on which to base the rationing of such premises, so far as the use of gas is concerned.

Western Junior Gas Association

The Council of the Western Junior Gas Association have decided that owing to the war it will be impossible to carry out any programme of meetings during the 1939-40 session. Two factors influenced the Council in arriving at this decision—namely, the long distances which many members have to travel to attend meetings and the undesirability of technical staff leaving the immediate neighbourhood of their place of business.

No subscription will be collected from members in respect of the 1939-40 session, as the Treasurer has sufficient funds in hand to meet the expected expenses. The position will be reviewed as occasion demands, and if any change of policy is decided on members will be notified.

C

AN EFFECTIVE METHOD OF

Shutting off Supply in Damaged Mains

The Isle of Thanet Gas Light and Coke Company (Margate) have given consideration to various means of quickly and effectively shutting off the supply of gas in mains damaged by aerial attack. In this article their Distribution Superintendent (Mr. A. G. R. Kennett) gives details of an interesting system which the Company have lately perfected.

GAS undertakings have been strongly advised to provide means wherever possible either to cut off sections of their distribution system or to reduce the flow of gas through their larger mains, in order to cope with fractures or conflagrations caused by aerial attack. The insertion of valves has been recommended, but these would involve considerable expense with probable delays in supply, and, unless frequently operated, might be found ineffective when the need arose.

The method evolved by the Isle of Thanet Gas Light and Coke Company comprises the drilling and tapping of mains at various selected points which will sectionalize the distribution system, and inserting a 3 in. bore wrought-iron or mild steel tube to within 5 in. of the road surface. This is securely plugged at its upper end, and surmounted with a surface box of the type commonly used in connexion with syphons, but with a sufficiently large opening to enable the plug to be removed when an emergency arises. The removal of the plug and passing the gasbag through the 3 in. tube—which, be it stated, is sufficiently large to accommodate a folded bag suitable for mains of 10 in. to 18 in. diameter, inclusive—and inflating it when in position, will effectually shut off the supply or reduce its pressure sufficiently to stem the stream while the fracture or conflagration is being attended to in the near vicinity.

The method of inserting the bag requires care, and the drilling should be clean-cut and free from any sharp edges, while the tube should also have no internal burrs throughout its length. In addition, the thread should be cut so as to prevent the tube protruding into the main. Disregard of these items might result in damage to the bag when being inserted, thus rendering the scheme ineffective.

To facilitate the passing of the bag into the main through the tubular sleeve, it is desirable that the squad should have definite established duties to perform, as expeditious carrying-out of the work is essential. Assume that six men comprise the squad, Nos. 1 and 2, each having a service respirator with C.O. attachment. The gasbag is compressed by No. 1, and, after No. 2 has opened the surface box and loosened the plug with the necessary tee-head spanner, No. 1 inserts a hook (formed on a $\frac{3}{16}$ in. iron rod) into the ring specially sewn on the bottom of the bag. No. 2 retains the bag-tube and holds the top portion of the rod, while No. 1 removes the plug and carefully inserts the lower end of the folded bag into the 3 in. tube (with the rod hooked on). No. 2 then gently pushes it downward, with No. 1 guiding. This operation can be followed more closely by reference to Fig. 1.

Meanwhile, No. 3 will have taken the open ends of the respirator tubes sufficiently far away on the windward side to a safe position. At night-time he should have a red lamp to protect himself, as well as to avoid the air tubes being interfered with. No. 4 will be in possession of an electric hand-lamp, wooden rod, and short pieces of $\frac{1}{2}$ in. (or $\frac{3}{8}$ in.) barrel for extension of the bag-tube, while No. 5 takes charge of the inflating pump and supply tube, together with a wad of rag (or waste) to stop up temporarily the surrounding space in the 3 in. sleeve.

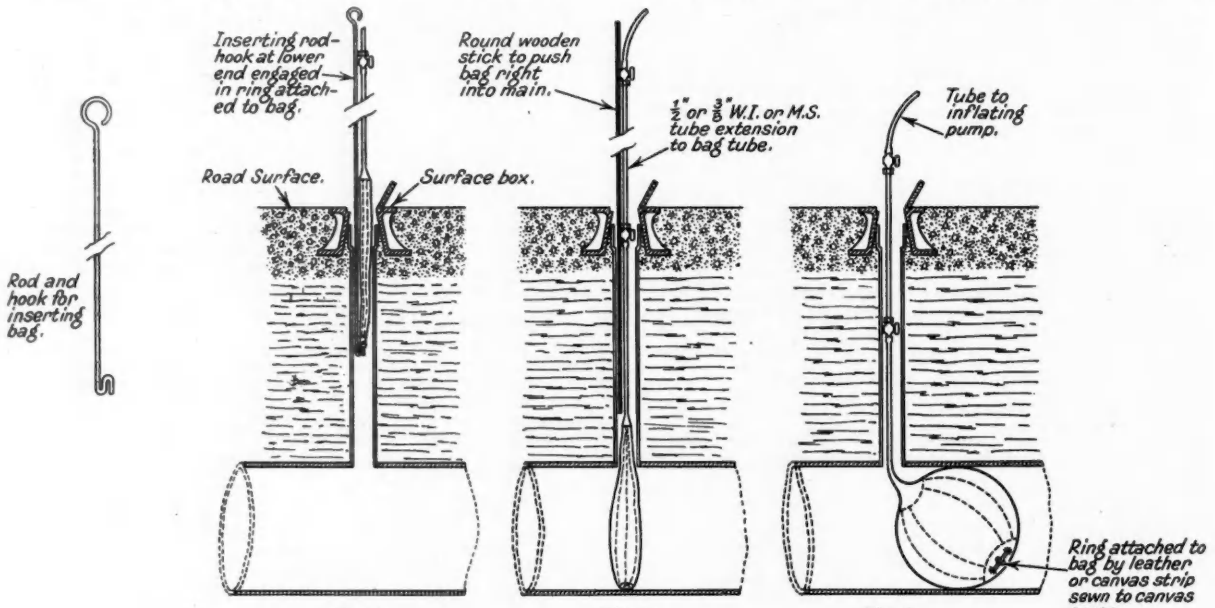

Inserting rod-hook at lower end engaged in ring attached to bag.
Road Surface.
Surface box.
Rod and hook for inserting bag.
Round wooden stick to push bag right into main.
½" or ⅜" W.I. or M.S. tube extension to bag tube.
Tube to inflating pump.
Ring attached to bag by leather or canvas strip sewn to canvas cover.

Fig. 1 Showing bag being entered into tube.

Fig. 2 Stick in position to push neck of bag into main.

Fig. 3 Bag in position in main fully inflated.

No. 6 stands by to assist in any direction and act also as a messenger if required.

After the bag has been passed down the tube and indication is clearly given, by sounding with the hooked rod, that it is on the bottom of the main, the rod is freed from the bag and withdrawn. The wooden rod—to avoid damaging the bag—is then employed to position the bag in the main (as indicated by Fig. 2), which is readily ascertained by the pressure of the gas ascending the sleeve. Prior to the bag being positioned, the bagging tube is lengthened by a short piece of barrel being screwed to its tap by No. 1, which Nos. 4 and 5 attach to the pump. Inflation then commences, with No. 2 holding the wooden rod in position to maintain the bag in its desired place. On the bag being partially inflated, No. 1, by means of the wooden rod, satisfies himself that it is in its correct position (as indicated by Fig. 3), and instructs Nos. 4 and 5 when the bag is fully inflated and the main blocked. The cock on the short extension piece is thereupon closed, the pump disconnected, the cock and extension piece pushed down lightly into the sleeve, and the plug replaced, all by Nos. 1 and 2.

The withdrawal of the bag is easily effected by Nos. 1 and 2, who work together, by first removing the plug, withdrawing the cock and extension piece, and opening the cock to allow air to escape. No. 1 then gently pulls the bag-tube, while a gentle

pressure sideways with the wooden rod helps to deflate the bag. Should any difficulty be experienced in this procedure, a service suction cleanser (normally utilized for clearing services) may be attached to the bag-tube and a small charge from the pump applied to the cleanser in the usual manner.

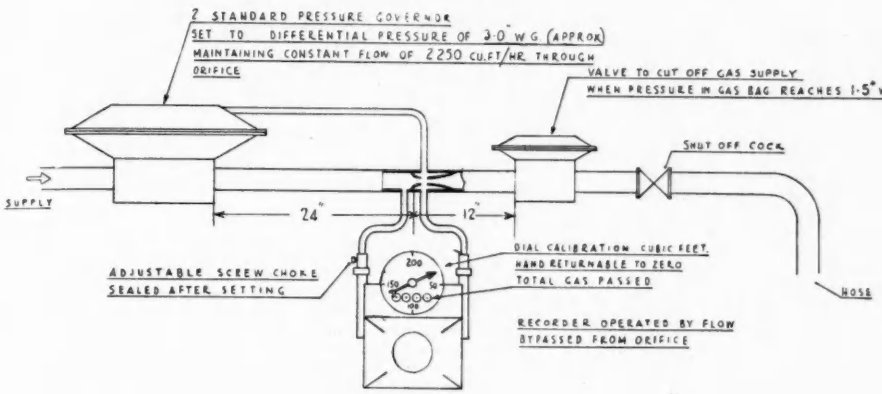
There is little need to describe the method of carrying out the process of installing the tube sleeve, as most undertakings will have the required equipment in stock. It may, however, be stated that a drill stand and 3 in. combined drill and tap, some short lengths of 3 in. wrought-iron tube (according to the depth of the main), 3 in. sockets and plugs, tee-spanner to fit square-headed plug, a 6 ft. length $\frac{3}{16}$ in. galvanized (or tinned) iron hooked rod, a similar length of $\frac{1}{4}$ in. or 1 in. round *wooden* rod, several short pieces of $\frac{3}{8}$ in. and $\frac{1}{2}$ in. wrought-iron tube, suitable road-pattern surface box, together with bags to suit the various sizes of main, and the usual inflating pump

It may be desirable to paint the cover of the surface box a distinctive colour, in order to assist identification in the dark.

It may be added that the process of inserting the bag was demonstrated on a live 18 in. main to occupy under five minutes from time of arrival on the site, while the process of withdrawal took a similar time. In the latter case, time is not quite so important, but great care and patience may sometimes be required to avoid damage to the bag. The method is simple to instal, equally easy to operate, and its cost is low. Indeed, experience in Margate indicates that the entire installation, complete with reinstatement, can be carried out for £3 or £4, dependent, of course, on the depth of the main and its accessibility.

Should any undertaking interested in this scheme not be quite clear on any point, application may be made to the Engineer and General Manager, Gas-Works, Margate, who will be happy to reply to any enquiries.

Metering Gas for Motor Transport


2 STANDARD PRESSURE GOVERNOR
SET TO DIFFERENTIAL PRESSURE OF 3·0" W.G. (APPROX)
MAINTAINING CONSTANT FLOW OF 2250 CU.FT/HR. THROUGH ORIFICE
VALVE TO CUT OFF GAS SUPPLY WHEN PRESSURE IN GAS BAG REACHES 1·5" W.G.
SHUT OFF COCK
SUPPLY
24"
12"
ADJUSTABLE SCREW CHOKE SEALED AFTER SETTING
DIAL CALIBRATION CUBIC FEET HAND RETURNABLE TO ZERO TOTAL GAS PASSED
HOSE
RECORDER OPERATED BY FLOW BYPASSED FROM ORIFICE

An ingenious flowmeter of the inferential type has been developed by the Gas Light and Coke Company. Its simplicity and compactness will be understood from our description and from the diagram. The meter, it should be stated, is designed for use at one rate only—2,250 cu. ft. per hour—and is intended for the measurement of gas at ordinary mains pressure for filling bags for motor transport. It should have a wide and ready application.

A DIFFERENTIAL pressure is induced by means of venturi throat inserted in the pipe line. This pressure is employed to pass a portion of the main gas flow through a by-pass circuit in which is situated a recorder. The recorder, although passing only a fraction of the main flow, is calibrated to indicate the total amount of gas passed. To keep the rate of flow as consistent as possible, and thus promote accuracy of registration, a governor is fitted to the supply in such a manner that a constant differential pressure is maintained across the venturi throat.

To the outlet of the flowmeter is fitted another and simpler governor, the function of which is to ensure that the pressure in the gas bag does not exceed 1.5 in. water gauge. The advantages of this are twofold: (a) The bag is not subjected to excessive strain; (b) when the bag is filled the flow is cut off suddenly so that no error occurs in the flowmeter due to a slow build up of pressure in the bag.

The by-pass circuit feeding the recorder is provided with a screw choke. This can be adjusted during calibration of the meter to counteract the variations in the performance of venturi throats and recorders resulting from manufacturing tolerances. After setting, the choke may be sealed to prevent interference.

The recorder is made from a 50 cu.ft./hr. standard high-capacity dry meter, provided with a special large dial. The indicating hand is returnable to zero to facilitate measurement of individual charges. Small indicating dials are provided to register the total gas passed over a period.

The governor before the venturi throat is a standard compensated service regulator, set to maintain a constant differential pressure of 3.0 in. water gauge.

The governor after the venturi throat is a simple meter regulator which functions as a normal pressure governor. It is set to give an outlet pressure of 1.5 in. water gauge, which should be sufficiently high to overcome flow resistance in the connexions to the gas bag.

The flowmeter must be calibrated at the rate at which it is to be used—viz., 2,250 cu.ft./hr. If this is accurately carried out and the flowmeter is used under good service conditions, only small variations in performance may be expected.

Gas Undertakings Results.

Maryborough (Queensland)

A substantial increase in gas sales is reported by the Directors of the Maryborough (Queensland) Gas and Coke Company, Ltd., for the half-year to June 30 last. The receipts for gas are £254 more than for the corresponding half of 1938, the sales having been the highest for the past seven years. Coke sales have been higher than during the same half of the previous year, but less tar has been sold owing to depleted stocks. On the other side, expenditure shows an increase, principally under the headings of taxation, coal, and wages. The Company have found that the removal of the showrooms and offices to the main business centre of the city, in order that their appliances might be more prominently brought to the notice of the public, has been fully justified. After writing-off £300 for depreciation, and payment of a dividend at the rate of 5% per annum, a balance of £307 will remain to be carried to the next account.

Blackpool

Sales of gas by the County Borough of Blackpool Gas Department continued upon their upward course during the twelve months ended March last. The total quantity sold was 1,495,229,600 cu.ft., an increase of 39,564,000 cu.ft. over the 1,455,665,600 cu.ft. sold in the preceding year. The number of meters increased from 41,633 to 42,697; and of public lamps, from 6,133 to 6,381. Of the total number of consumers, 22,657 are provided with prepayment meters. The average consumption during the year through ordinary meters was 44,148 cu.ft., and through prepayment meters 19,518 cu.ft.; the average for both classes of consumers being 31,078 cu.ft. The average consumption through prepayment meters shows a decrease of 557 cu.ft. per meter. There was a considerable increase in the installation of central heating boilers during the year; the total number of gas-fired boilers fixed on consumers' premises at March 31 being 116. For engines and central heating supply there is a flat rate charge of 4d. per therm, or 1s. 6d. per 1,000 cu.ft. The average price received for all gas sold during the year was 6.3d. per therm net—equivalent to 2s. 4.34d. per 1,000 cu.ft. A net profit of £4,146 is shown on the past year's working.

Manchester District Association of Gas Engineers

The Ordinary General Meeting of the Manchester District Association of Gas Engineers was held at the Midland Hotel, Manchester, on Friday, Oct. 20. Mr. H. Singleton, M.I.Mech.E. (Huddersfield), President of the Association, occupying the Chair.

LUNCHEON

A Luncheon was provided prior to the business proceedings.

The PRESIDENT, in proposing the Toast of "Our Guests," said that they were meeting under very different conditions from those of the last Meeting. The British Empire, along with its Allies, were at war with the very powerful, militarist German nation. During the last war the Gas Industry, along with its sister industry, received very high praise from the then Minister of Munitions, Lord Moulton, and he would like to read a short paragraph which appeared in an Address given by that gentleman in June, 1918.

Lord Moulton said:

> Your Industry, typically peaceful in character and aims, has furnished material for purely war purposes without which it would have been impossible to maintain the fight. I have thus learned as well the flexibility and resourcefulness of the Industry as the importance to the nation that all its varied capacities should have free scope. Not only have the benzole, toluole, and ammonia produced by it furnished the materials for our high explosives, but in the direction of other needs of very different nature it has given promise of similar usefulness.

The PRESIDENT, continuing, said he was perfectly certain that the present effort of this country would be again successful. The struggle in which we were engaged to-day was much greater than that of 1914-18. The issue was a far more serious one even than that. He was aware that their efforts would be somewhat restricted by fuel rationing, and other conditions which, to them, appeared to be unnecessary impediments. He felt quite sure, however, that with the full co-ordination of the proper authorities those conditions would be relaxed in the near future—at any rate, he hoped so. The Gas Industry would be able to show then to better advantage what it could do in the assistance of the nation under present emergencies.

A Welcome to the Visitors

To come to his Toast, he had to give a very hearty welcome to the visitors. They were very honoured by their presence. He would like, in the first instance, to refer to his Chairman, Councillor Sidney Kaye, Chairman of the Huddersfield Gas Committee, and then to Alderman Lord, the Chairman of the Stockport Gas Committee, Mr. F. B. Holmes (Messrs. Holmes and Company), and Mr. Charles Cooper (Messrs. Holmes). He had an apology for absence from Mr. D. M. Henshaw (Director of Messrs. W. C. Holmes), who was at present detained in the south of England. They had also present Professor Townend, of Leeds University, and Mr. H. Platt, President of the Manchester and District Junior Gas Association. An apology for absence had also been received from Mr. Brown, the Managing Director of Messrs. Hopkinson, Ltd.

On such an occasion it was usual, he understood, that they should tender their very best thanks to the representatives of the firms, and the Chairmen of Committees, who had entertained them during the past year. He wished to say with all sincerity that he, personally, and he was sure the same could be said of all the members of the Association, very much appreciated the hospitality and entertainment they had received at Huddersfield in June, which had been extended to them by Messrs. Hopkinson, Messrs. Holmes, and the Chairmen and members of the Huddersfield Gas Committee.

There were also present the successful candidates who were examined last April, and it was only fitting that he should call upon their friend Mr. George Dixon, the President of The Institution of Gas Engineers, to present certificates to them. He did not include Mr. Dixon in the guests, because he was rather at a loss to know whether he was a guest or whether he was representing The Institution of Gas Engineers, or was present as a past-President of the Association.

Councillor SIDNEY KAYE (Chairman, Huddersfield Gas Committee), in responding to the Toast, said that times had changed since the Association met at Huddersfield; none of them really expected then that the nation would find itself at war in such a short time. They had had thrust upon them the Fuel and Lighting Order, 1939, and only extreme patriotism prevented him from saying what he really thought about it. He would say no more than this; that had more time been spent in Whitehall in drafting it, things might have been very much better for the Industry.

As one of the Chairmen of the Fuel Advisory Committee, words failed him to say how it was ever going to operate satisfactorily. Yet, in his opinion, it was going to have rather far-reaching results. The Government had at any rate found out something which the Gas Industry did not find out, or did not know—that was, how to produce more coke and more benzole with a decreased carbonization of coal. So that at any rate they could at least learn something from the Government in regard to the Gas Industry. It did seem, however, that this might have a more far-reaching effect from the financial side of the Industry. If there was going to be a decrease of consumption on the part of domestic users and small industrial consumers, then unless the difference was made up by increased consumption on the part of the large users there would be a detrimental effect on many balance-sheets.

Another very important point was the absorption of a certain amount of labour in the Industry which would be put out of action as a result of such restriction. He might refer, in one case, to the lamp-lighters. The result of the present lighting restrictions obviously meant that there were a tremendous number of men throughout the country whose services could be dispensed with by gas undertakings so far as their actual need was concerned. He felt certain, speaking for one undertaking alone, that it was not the desire of the undertakings throughout the country to dispense with these men's services immediately, because they were men upon whom they would desire to call for assistance at a later date. The absorption of labour of this character was a matter which would have to be considered nationally.

There was one other point upon which he would like to touch in regard to the connexion between gas undertakings and electricity undertakings. He was aware he was treading on very dangerous ground. There was a feeling in the country that because of the restrictions imposed there might be unfair competition between the two. So far as Huddersfield was concerned they had adopted, as a matter of policy, something which he believed was on common-sense lines. For the duration of the war neither undertaking would take advantage of prevailing conditions to obtain business from the other undertaking. If that policy was adopted as a national principle there need be no qualms as to the actual result of present day restrictions.

His own feeling was that the Government rushed into war legislation very hurriedly, and probably very properly having regard to the prevailing conditions. Within a reasonably short time, he believed, they would find that if the restrictions were not entirely removed, or at any rate considerably modified, some means would be adopted to relieve the burden upon the Gas Industry.

A Debt to the Association

Mr. DIXON remarked that he had not a great deal to say, and would merely speak from a personal point of view. In the first instance, might he once again express his pleasure at being able to fulfil a little duty. Personally, he owed to the Association almost everything that he had gained in the Gas Industry. The Association was, of course, largely responsible for his being President of The Institution of Gas Engineers; and he was very proud of the support that he had received from them in putting him into that position.

It might be felt at the present time that The Institution of Gas Engineers was doing very little indeed. Much of its social side had been curtailed owing to circumstances over which they had no control. Nevertheless, there were activities going on at the present time, though one was not at liberty to say anything much about them.

It was a great pleasure to him, as he had said, to be called upon to present certificates to successful students who were not only entering into an Industry which was full of promise to them, but they were also entering into an Industry which was animated with a good deal more than an ordinary helpful spirit. They were entering into an Industry every member of which was waiting and willing to accept them as friends. He said that particularly of the Manchester district, because he knew how carefully everybody connected with the Manchester District Association was to see that his students had a square deal and

made progress to the full satisfaction of those who had helped them.

Mr. Dixon then presented the certificates to the successful candidates.

GENERAL MEETING

The Ordinary General Meeting of the Association followed, and the Minutes of the previous Meeting were taken as read and approved.

The members rose in silent tribute to the memory of Mr. J. E. BUCKLEY, who had been a member of the Association since 1922.

The following gentlemen were then inducted as new members of the Association:

A. K. Collinge (Works Engineer, Preston Gas Company).

J. H. Booth (Engineer, Manager, and Secretary, Winsford Gas Company).

V. J. J. Siddons (Engineer and Manager, Rawmarsh Gas Department).

Recommendations of Committee

The PRESIDENT explained that the activities of the Association under war conditions had been considered, and it was recommended that they be carried on as well as circumstances permitted. To put the matter in order he proposed that the recommendation be adopted.

Mr. CHARLES WOOD (Bradford) seconded the proposition, which was carried unanimously.

The PRESIDENT went on to say that the Committee recommended that Mr. James Bridge, F.C.S. (Elland), be elected an Hon. Member of the Association, and he had great pleasure in proposing that that recommendation be adopted. In Mr. Bridge they had had a very untiring worker on behalf of the Association. He was elected a member in 1920, and was Hon. Secretary from 1929 to 1937 when, on account of ill-health, he was compelled to resign that office. The Committee had had in mind, in making the recommendation, that but for ill-health Mr. Bridge would have been invited to accept the Presidency of the Association long ago. It was only fitting and proper that now, for the reason stated, Mr. Bridge was unable to accept such an offer, another honour which was within the province of the Association should be conferred upon him. No words were needed to introduce Mr. Bridge to the members. Probably his work was very much better known to the members of the Committee than it was to the members at large; but he could assure them that Mr. Bridge's work in regard to education generally in Yorkshire and on the Education Committee in London had been very much appreciated, and his work for the Association stood, as it were, like a monument.

Mr. GEORGE DIXON, in seconding the adoption of the recommendation, said that Mr. Bridge had done more than a man's work for the Association. He did not wish to second the recommendation on that line alone, because Mr. Bridge had only done what he simply could not help doing. The urge for that work was in his blood. He had lived for the Association, and he had done everything which was humanly possible for it; bringing it to a successful position which could be realized only by those who visited other district Associations and saw the way meetings were carried on in other districts.

The Manchester Association had a name for carrying on their meetings in a business-like and proper way; and he was not afraid to stand up in the Manchester district and say so. There was another reason why he desired to second the proposition, and that was because of the living personality of Jimmie Bridge, of which they were all conscious. He had been privileged to work with him ever since he joined the Juniors a long time ago. Mr. Bridge was the one who brought him into the Industry, or at all events into the Juniors. He had always shown a sincere desire to help everybody.

Mr. CHARLES WOOD (Bradford), as an Hon. Member of the Association, also supported the recommendation. He had known Mr. Bridge for many years and was aware of the excellent work he had done for the Association. As the oldest member of the Manchester District Association he had come specially to support the nomination of Mr. Bridge.

Mr. T. REYNOLDS (Stockport) also cordially supported the nomination, which was carried unanimously with hearty acclamation.

Mr. JAMES BRIDGE, in acknowledging the nomination, said that it was a very important occasion for him and a red letter day. When he joined the Association some years ago he had certainly, among other things, two thoughts in his mind. One was that he should be the Secretary of the Association. There was no hesitation in his mind about that; he had made it up on that score. He thought also that some day he might have the privilege and honour of being its President. However, his doctor had decided that the latter pleasure must be denied him; but neither he nor anyone else could take from him the very great pleasure he had enjoyed for eight years as the Secretary of the Association.

It was only natural he should want to be the Secretary, because he had had some previous experience with the Manchester and District Junior Gas Association. He was the Secretary from 1913 to 1919, and then in 1929 he was elected Hon. Secretary of the Senior Association. Throughout the whole of the years that he held office he felt he had had the confidence of every member. Even when he was acting in the capacity of Treasurer he still felt he had the confidence of those gentlemen who did not pay on the first call. When one felt that one possessed the confidence of all the members it certainly took the irksomeness out of any of the work to be done, and made it a great pleasure. The Presidents and the Committees had helped him on every possible occasion; and it was certainly not difficult for him to do the work.

He remembered telling them some two years ago that in Mr. Burton they had a Secretary who would do far better than the one who was retiring, and they would see that as year by year went by they would wonder how they had tolerated him, the speaker, for so long. As long as he lived, he would feel that the members had awarded him far more than his service had deserved.

Election of Officers

The following officers were elected for the ensuing year:

President.—T. Reynolds (Stockport).

Vice-Presidents.—J. E. Lister Cooper (Yeadon) and A. Mackay (Stoke-on-Trent).

Hon. Secretary and Treasurer.—H. Burton (Shipley).

Auditors.—Francis Elliott (Leyland) and J. W. Brearley (Swinton and Mexboro').

Committee.—A. F. Ames (Burnley), J. Carr (Stretford) and N. Hudson (Mirfield).

A Paper by Mr. N. Hudson (Mirfield) entitled "Total Sulphur Below 10 Grains per 100 cu.ft.—The Practice and Results on a 140 million works with the Oil-Washing Process," was then read by the Author, and was followed by a discussion. The Paper will be found on later pages of this week's "JOURNAL," and the discussion will be dealt with in a subsequent issue.

Tottenham Company to Suspend Street Lighting Agreement

"A Public Spirited Offer"

Appreciation of the generous and public-spirited offer of Tottenham and District Gas Company to discontinue the present agreement and save nearly £4,000 a year to the ratepayers for street lighting has been expressed by Wood Green Borough Council.

The letter from the Gas Company suggested that as all street lighting had been discontinued the present agreement between the Council and the Company should be suspended during the war and come into operation again at the conclusion of hostilities for the unexpired period.

The Company were prepared to maintain the lamps, lanterns, burners and glassware at a charge of 6s. 6d. a lamp per annum for the standard three-light No. 1 pattern lamp and a proportionately increased rate for the larger types.

The Company suggest also that they be permitted to increase these, if necessary, from time to time to cover any increase in the cost of labour or materials.

The present "all-in" rate for the total number of gas lamps in the borough at Aug. 31 was £4,133 8s. 3d. per annum, and a special charge for maintaining all lamps in good condition, including painting and glazing as suggested, would be £435 8s. 6d. per annum. There would thus be a reduction in the cost to the Council of £3,697 19s. 9d. per annum, while the maintenance in good condition of all the Council's materials would be assured.

The Company's offer was accepted with thanks.

Total Sulphur Below 10 Grains/100 Cu. Ft.

A Paper to the Manchester District Association of Gas Engineers at their General Meeting at Manchester on Oct. 20.

MR. NORMAN HUDSON (Engineer, Manager, and Secretary of the Mirfield Gas Company) discusses the practice and results on a 140 million works with the oil-washing process.

Perhaps it would be in order to start this Paper by relating why my Directors were interested in such a process, and why they were prepared to gamble on results—because at the time they decided to order such a plant, although laboratory experiments were very promising, no commercial plant was operating.

Four years ago it was becoming more and more apparent that, for various reasons, sulphur in town gas was not only an obstacle to further development in gas sales in certain direction, but was, in actual fact, reducing the margin of profit on some of the business we already held and was also at the same time presenting both an added sales point to our electrical competitors, and forcing upon us, in certain instances, the need to accept a lower therm price for our commodity than was necessary.

May I take these points one by one.

Firstly, sulphur content as an obstacle to development in gas sales. It is common knowledge that among the majority of low and medium priced houses being built about four years ago in Mirfield as elsewhere, most bedrooms were being constructed without flues, and almost without exception local authorities approved such buildings—whether we thought it wise, from the point of view of national hygiene, is beside the point.

From experiments carried out by people fully qualified to do so, it was shown that gas containing around 25 grains of total sulphur was not going to be a suitable means of heating such rooms fluelessly. In other words, space heating of small flueless rooms of a height below 9 ft. would not be achieved in the coldest weather with such a gas with that degree of well-being and comfort to the occupant that was and is essential if the load was to be won and developed. Many held the view, and since then it has been so confirmed by a panel of eminent doctors (see report by the Royal College of Physicians entitled "Domestic Heating by Gas," issued December, 1936), that gas of 10 grains total sulphur content could be used fluelessly to raise the temperature of a room to over 60° F. when it was freezing outside, without discomfort to the persons occupying such a room, provided, of course, that a reasonable air change rate was maintained such as is effected by doors and windows, although closed, and the ventilators usually specified by local authorities in flueless rooms. Further, we assumed, and quite correctly, I think, that provided such small rooms could be so heated the larger and loftier rooms could be similarly dealt with. Hence a first conclusion was arrived at—provided that the total sulphur content of our gas was reduced to below 10 grains, almost any space heating job could be tackled fluelessly by gas, and instead of being excluded from flueless rooms in new and, for that matter, old property, the Company would have opened up to it a new sphere for gas sales.

Secondly, the reduction of the margin of profit on some business already held. Many chemists connected with the Gas Industry have produced data built up from extensive experiments which have proved beyond doubt that the sulphur compounds in town gas seriously affect the life of certain gas appliances and the deposits caused by their burning in proximity to certain metals gradually reduces the efficiency of such appliances and increases their maintenance costs, and I feel sure the experience of every gas distribution engineer will confirm this as ours did.

Hence a second conclusion—the lower the sulphur content of our town gas the longer would be the life of certain appliances, and the lower would be the maintenance costs, thus increasing the Company's margin of profit on gas used in such appliances.

Thirdly, the giving of an added sales point to our electrical competitors. Some may debate our contention under this heading, but our experience convinced us that, whether the statement be true or not, our competitors got away with a deal of sales by stating that electricity is cleaner in operation than gas, and we had observed that where there was a tendency for appliances to become soiled when working, the extent of this soiling was roughly in proportion to the sulphur content of the gas.

Hence a third conclusion—the lower the sulphur content of our town gas, the better would be the appearance, after using, of certain gas appliances sold and hired by the Company, and the higher would be the appreciation of the customers.

Fourthly, the need to accept a lower therm price than was necessary. When selling a gas with 22-25 grains total sulphur, it was necessary in almost every case to fit for heating purposes apparatus connected to flues, which apparatus, on an average, could not claim a higher efficiency from a heating standpoint than 45%, and to make this gas available to the average consumer at a competitive price with solid fuel it was necessary to sell at no more than 5d. per therm. On the other hand, if flueless heating by gas could be made generally suitable, all direct flue losses would be saved and a figure of 10d. per therm could be obtained.

Hence a fourth conclusion was arrived at—with a sulphur content low enough to enable flueless heating to be used extensively, the Company could hope to get new business at the standard flat rates prevailing, and could present a very strong case indeed when competing with solid fuel with the two part tariff that was then in existence.

With these possible advantages in mind it was decided that, if it could be shown that an oil washing type of plant could be purchased and installed, which, when operating on horizontal gas would reduce the sulphur content to 10 grains/100 cu.ft. or less and at the same time produce a benzole revenue that would meet all charges against the plant, so placing us in a position to market a 10 grain sulphur gas as against a gas containing 22-25 grains total sulphur without any additional charge against gas production, and providing the initial capital outlay was not too great, such a plant should be installed.

Figures were got out which indicated that this should be capable of attainment, and the plant was put in. Since it was to a certain extent experimental, costs were kept as low as possible. For instance, instead of putting in a new oil washer, one-half of an existing ammonia brush washer, which was too big for our output, was utilized for washing purposes—possibly this was a mistake, since we find in summer weather it is not up to capacity, and we have to increase the absorptive capacity for carbon bisulphide and benzole by using an oil washing mixture having a lower molecular weight than straight wash oil, and so an increased absorptive capacity per gallon circulated. Although this mixture costs more per gallon than straight wash oil, it has a compensating advantage in that it has almost eliminated the formation of sludge in any part of the plant. The mixture is one-third gas wash oil and two-thirds tractor vaporizing oil.

The retailing of the experimental work carried through on the plant would not, I think, interest you, but possibly a brief description of its operation and some operation data may.

The gas, after H_2S removal, is passed through the rotary brush washer in which wash oil mixture is circulated at the rate of 25 gallons per 1,000 cu.ft. gas treated, in addition to each of the four bays being separately circulated, and from there the rich oil is in the main treated as in an ordinary benzole plant. The whole of the distillation is carried out by the exhaust steam collected from the steam engine driving the rotary washer and the 5 b.h.p. steam engine driving the quadruple pump for circulating the oil in the washer—in fact,

the live steam used for driving this 5 b.h.p. engine is the only steam demand that the plant makes upon our steam plant.

On leaving the still, the vapours, after a vapour/oil heat exchange, are passed through a fractionating column, and the first condensate—*i.e.*, from the vapour/oil heat exchange—is returned as a reflux to the third bay of the washer, the second condensate—*i.e.*, from the column—is returned to the first bay and the vapours passing the control point at the top of the column, at present operating at 69° C., are condensed and go to the benzole storage tanks.

Control of this final temperature is effected by both a steam release control, which when the temperature starts to rise from 69° C. opens and blows some of the exhaust steam to waste, and by deflamation, in which case an oil valve opens, and oil previously warmed by passing through a coil in the fractionating column to about 45° C. is admitted through a seal into the top of the still. Both the valves are operated by the same Arca regulator.

Although the fractionating column is not essential to the process it is the means of controlling the quality of the benzole produced as well as the proportion of the total benzole in the gas which is recovered. The exhaust steam available is used to strip the wash oil completely of hydrocarbons, the still temperature being maintained at 100° C., and then a secondary separation is carried out in the column.

As stated, this column is situated in the vapour line after the oil to vapour heat exchange, and the outlet temperature from it controls both the flow of cooling medium through the coils in the column and also the exhaust steam supply to the still. By such an arrangement, the condensates mentioned above, the composition of which is governed by the final controlling temperature at the top of the column, can be returned to the stripped oil system and become part of the wash oil until their concentration therein is so high that no more can be absorbed from the gas. Although in the still complete stripping is effected, it is possible by adjustment of the final control temperature to decide what percentage of the distillates shall be retained as liquid crudes with the knowledge that practically the whole of the CS_2 will be in that percentage so retained.

Below are set out some analyses and operating data collected in the operation of the plant, but I think I ought to state here that the gas treated by this plant is on average a mixture of one-third stripped coke oven gas and two-thirds horizontal retort coal gas made by our own carbonizing plant, and I am sure that if the full volume had been straight coal gas the same purification results would have been achieved but the financial results would have been decidedly better, since we are now removing sulphur compounds from one-third of our gas which gives us no benzole revenue.

OPERATING DATA.

Representative Working Conditions.	
Temperature of oil and gas in scrubber (summer)	17°—23° C.
" " " " (winter)	10°—15° C.
" of rich oils entering still after pre-heat	75°—85° C.
Sulphur in gas entering washer (summer)	22—25 grains.
" " leaving washer "	7—9 grains.
" " entering washer (winter)	20—30 grains.
" " leaving washer "	6—10 grains.
Oil circulated per 1,000 cu. ft. gas treated	25 gals.
Exhaust steam per gallon of oil	0.5 lbs.
Representative Tests on Benzole Produced.	
Sp. Gravity at 15.5° C.	0.861
Retort Test at 120° C.	90%
New N.B. test at 100° C.	73%
" " at 160° C.	98%
Sp. Gravity of O.R. Benzole	0.864
Total Sulphur	1.44%
Sulphur as CS2	0.95%
Tests on Reflux Runnings.	
To 1st Bay of Washer.	
Total Sulphur	0.87%
Sulphur as CS2	0.16%
Sp. Gravity at 15.5° C.	.885
To 3rd Bay of Washer.	
Total Sulphur	0.76%
Sulphur as CS2	0.16%
Sp. Gravity at 15.5° C.	.877

FINANCIAL DATA.

Annual Income.		
18,345 galls. of Benzole at 1s. 1.2d. gal.		£1,010 6 4
Annual Expenditure.		
Amortization of Plant : £2,500 over 20 years, i.e. at 7%	£175 0 0	
Make-up Oil : 900 gals. Mixture	£29 3 4	
Fuel for Steam Raising : 180 tons 1 : 1 Mixture Pea coke and ⅜ in. Breeze	£90 0 0	
Thermal Replacement : Rate of 1.6 therms per gal. of Benzole	£146 15 0	
Sundries : Lubricating Oil, Water for Arca Regulator, etc.	£20 0 0	
		£460 18 4
Annual Profit		£549 8 0

Concerning the above items, I can state that the income is actual net receipts for benzole produced ; the capital figure for

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amortization is based on the recent costs of a plant complete with new washer, our plant did not cost us as much as this ; make up oil is actual costs ; fuel for steam raising has been calculated from the figures given by the makers of the steam engine driving the oil circulating pumps when running at full load at the average steam pressure available and allowing that the fuel we use has a heat value of 10,000 B.Th.U./lb. and raises 5½ lb. of steam per lb. ; the thermal replacement cost is charged at the figure we pay for coke oven gas delivered into the crude holder at our works—namely, 1.2d. per therm—and actually if this figure had been calculated on our balance sheet figures and based on nett coal costs plus wear and tear, the annual figure would have been the same ; and sundries are assessed by comparing present with past expenses for these items.

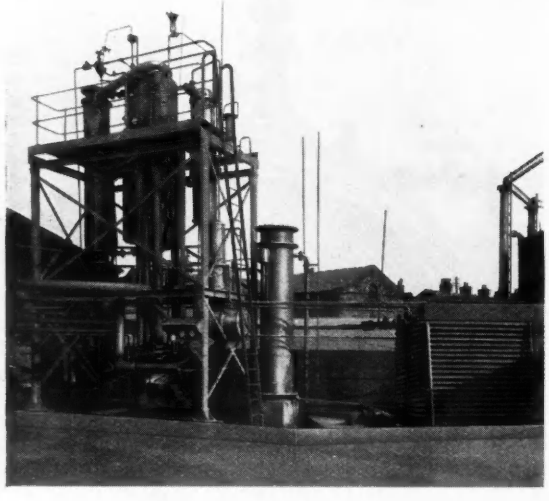

Fig. 1

Gas desulphurizing plant at the works of the Mirfield Gas Coy.

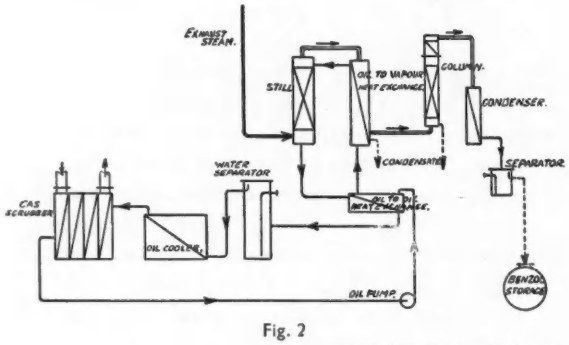

Fig. 2

[By courtesy of "Chemistry and Industry."

Flow diagram of oil washing installation. [Note that "Oil to Oil Heat Exchange" should read "Oil to Boiler Feed Heat Exchange."]

With regard to the results of the plant, I should like to treat them under various headings.

Firstly, financial. It will be seen from the foregoing figures that the operation of the plant has resulted in a net revenue gain to the Company of £550 per annum, yet it is only fair to relate that when the new evaluation scheme for crude benzole comes into operation on Jan. 1 next, it will mean that the receipts for benzole will drop by 0.43d. per gallon. This is practically wholly due to the high sulphur content. I feel that those responsible for this penalty have had in mind the view that in a crude with such a high sulphur content, half of this sulphur would be compounds other than CS_2, whereas the analysis given above proves that CS_2 constitutes 66% of the total sulphur, and since this is easily removable it should not result in such a heavy penalty.

The present interim value of the above crude benzole by retort test is 12.90d. per gallon, and under the new evaluation scheme it would be 12.36d., being classed as Grade C. Abnormal, Schedule 2. It would, however, receive a higher adjustment rate at the end of the financial year under the new scheme, since this is now to be calculated on the full refined benzole content instead of on a flat rate of 65% refined benzole. Assuming the adjustment to be 0.5d. per gallon of refined benzole, the new scheme will give a figure higher by 0.11d. per gallon than the retort test valuation system, so reducing the drop in price to 0.43d. per gallon.

These figures have been based on the following basic interim prices:

Refined Motor Benzole	1s. 5d.
90/160 Solvent Naphtha	1s. 5d.
Creosote	0s. 4d.
Petrol	1s. 6d.

Further, the new scheme provides that if the crude benzole can be brought below 0.75% total sulphur it comes into another class, and would benefit in price to the extent of approx. 1.0d. per gallon. We are, therefore, at the suggestion of the makers of the plant, fitting a continuous washing circulator on the benzole produced, by which it is hoped the majority of the CS_2 will be removed from the crude produced at a very slight cost per gallon.

From the tables of results it will be seen that, although we have been washing 2.5 gallons per ton of coal carbonized, the percentage distillate over at 120° C. in the benzole produced has remained high and has consequently resulted, under the present price scheme, in a good price per gallon. It may be of interest to you to know that when washing 1.75 gallons per ton a dry point on a distillation test has been maintained over a period at below 120° C.

Another addition we propose making is the installation of a heat exchanger on the hot oil flow from the separator to the cooling racks by which boiler feed water will be preheated and the fuel costs for steam reduced.

Should the above two developments be as successful as experiment and calculation have indicated, the net revenue of past years should be more than maintained in spite of the new evaluation scheme.

Secondly, operational. The design of the plant is such that constant working results are readily obtained with the minimum of skilled attention, and on a relatively small works, where the day shift if the only one carrying skilled supervision, this is of the utmost importance. Repairs and replacements in over three years' running have been negligible.

Thirdly, effects. Under this heading, the most important in my opinion, the ability to distribute gas treated by this plant, has had far reaching results.

One result was that the large circulation of oil per 1,000 cu.ft. of gas treated eventually made our distribution system free from naphthalene, although at first stoppages from this source at the extremities of our district seemed to increase. We could only put this down to the naphthalene free gas picking up old deposits, and when extreme variations in temperature occurred, they were re-deposited on exposed services.

Another result was the disappearance of gum trouble from the district, and as far as we can judge this coincided with the introduction of tractor vaporizing oil as part of the washing medium, and the return of the reflux condensates to the washer. For some years we had had an area around the works about three-quarters of a mile in diameter, in which gas injectors of the fine orifice type, thermostats, pilots, gas cocks, and meter valves had given a deal of trouble because of gum deposits, and for the first few months of experimental work on the new plant this trouble continued. During this experimental period we were also able to mix with 150 gallons of commercial motor spirit 50 gallons of our benzole for use on the works vehicles with trouble free results.

Suddenly this changed—our gum troubles started to disappear, and it was impossible to use even a 10% mixture of benzole in the motor spirit we bought because after a few miles running the whole of the butterfly petrol control and the induction tube immediately above it on the vehicles became stuck and blocked up with gum respectively, and such is the position to-day. As an example I can quote the case of a fire in the offices at the works, the injector of which had

to be cleaned monthly with dilute caustic solution to remove gum, and is now not touched once in 12 months.

In view of the detailed essays which have been written on gum formation, and the fact that the gas is treated in this plant less than an hour after being made, I do not profess to explain this phenomenon except to state that possibly the operation of this plant results in certain gum-forming constituents of the gas, such as diolefines, with b.p's ranging between 40°-50° C., being washed out of the gas and eventually coming over with the crude benzole to the storage tanks.

Another result which this plant has produced is a reduced maintenance bill. As you are all aware, it has become necessary in the competitive conditions which now prevail to give an aftersales service which can become a very costly item, and on some appliances can remove the whole of the profit from the gas used by such appliances.

May I quote an example—the small instantaneous gas water heater. In our district we have found out that such a heater can on average be expected to consume 20 therms per annum, and of this only 10 therms at the most can be considered new business; the other 10 therms having been used previously for hot water supplies via a hotplate or similar appliance. Then may we assume that there is no further charge against this new business beyond gas into holders, say, at 2.5d. per therm, the same selling at a figure around 10.0d. per therm. This would leave a gross profit on the extra gas consumed of 6s. 3d. Again, from experience, we have found that we cannot service such an appliance under 3s. a visit—*i.e.*, labour, material and transport. Thus two visits per annum reduces the profit on the gas used by that appliance to 3d.—in fact, it is a loss, because 2.5d. per therm is not the true figure at which the gas should be charged up for new small business of this description.

However, since we have been sending out gas with no more than 10 grains total sulphur we have been able to give satisfaction to our consumers with such an appliance by servicing it once every 12 to 15 months, and are now of the opinion that this can be extended confidently to 18 months with the consequent result that we can show a margin of profit on the gas consumed by such an appliance.

May I just quote one further case—a storage water heater burning 15 cu.ft. per hour, never turned out and serving a family of five persons. Servicing once in twelve months is now found to be too frequent. Previously it was three times a year.

To sum up this result I can state that though in proportion to our output we have possibly sold and fixed as many new appliances such as water heaters, thermostatically controlled cookers, central heating boilers, &c., as the average undertaking, and are doing more installation work in the district than we were four years ago, and at the same time now boast that all complaints are visited within 24 hours of them being made, we have not in the past four years had to increase our fitting and maintenance staff.

Another, and probably the most important, result of selling a gas with not more than 10 grains total sulphur has been that in the modern speculatively built house, as well as in older houses, we have been able to install flueless panel fires and radiators, burning up to 1 cu.ft. per hour per 100 cu.ft. air space, which have been and are being used with complete satisfaction by the consumers. This business has, of course, not yet been big, but it has already given indications of very promising possibilities.

We are, however, at a disadvantage in going after this business in asmuch as the choice of attractive appliances we have to offer is very limited—nothing like that of our electrical competitors. It is quite understandable that the appliance manufacturers are not going to spend large sums in putting into production appliances which by the very nature of the present position in the Gas Industry offer little hope of reasonable quantity sales. There has, however, been quite an appreciable development during the last two years in the marketing of such appliances, and our choice is now considerably larger than it was.

That, gentlemen, is to date the history of "gas with less than 10 grains total sulphur per 100 cu.ft. at Mirfield," and I can assure you that my Directors are very pleased with the venture—or should I say adventure?

(A report of the discussion which followed will be dealt with in a subsequent issue of the "*Journal*.")

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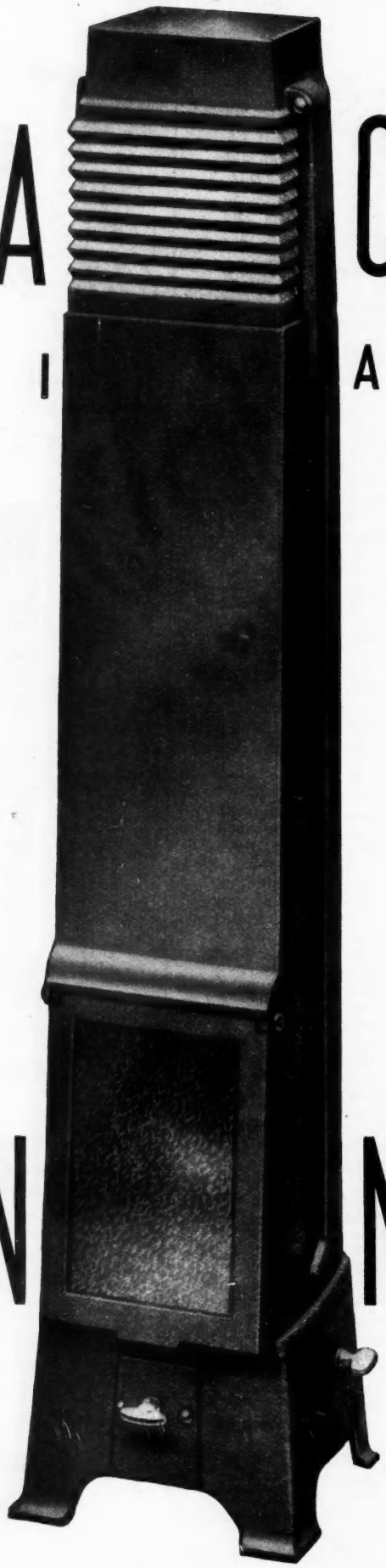

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Gives a uniform and healthy heat.

NO FLUE REQUIRED.

Consumption—6 cu. ft. per hour—to meet Gas Ration.

Fitted, if required, with Boiling Burner at top for making tea, etc., "on the spot."

An important new market for this well-known radiator is now in being.

You can confidently recommend it in your area for A.R.P. Posts, Shelters, Camps, Hutments, etc.

It is supplied in single, double or triple columns and in two sizes.

Supplies and deliveries of this radiator, and of all Cannon Gas Appliances, are normal.

CANNON

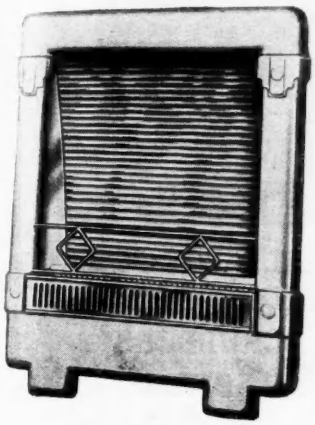
Sole Manufacturers:
Cannon Iron Foundries, Ltd.

Head Office and Works:
Deepfields, Nr. Bilston, Staffs.

Trade News

Modern Portable Heaters

In pursuance of their policy of always keeping abreast of the times, Messrs. Falk, Stadelmann & Co., Ltd., of Farringdon Road, E.C.1, have lately introduced a number of up-to-date and exceedingly attractive portable gas heaters. Of these, particular attention should be drawn to the "New Silvex" and "Silverscreen," while for those who prefer a colour finish and the vertical radiant type of heating element there is the "Rayflex."



The "Silverscreen"

The first-named heater is particularly suitable for bedrooms, bathrooms and small offices, having specially designed three-section fireclay elements which fit horizontally over the burner. The heat can be directed to any angle simply by tilting the reflector to the required position. The corrugated reflector, tubular stand, and front burner guard are made from heavy gauge brass with chromium-plated finish. The heater is supplied complete with air regulator and chromium-plated pressure regulator with flex tube nozzle. The "Silverscreen" employs the same principle of horizontal elements but has a larger reflector surrounded by cast-iron and heavy-gauge steel frame. It is fitted with a backstay which enables the heater to maintain a rigid position, while a drop type handle allows it to be carried easily from room to room. The "Rayflex" has four vertical radiants set in a well-constructed heavy-gauge stamped steel frame which is available in three different coloured paint finishes—viz., brown, shaded dark brown; green, shaded gold; and biscuit, shaded vandyke brown. Reflector and control tap are optionally copper or chromium-plated. This heater is designed to give a wide angle of reflected heat, while its high efficiency renders it eminently suitable for economical use in these days.

A Gas-Heated Decontamination Tank

A decontamination tank for the treatment of clothing fouled by poison gas has been produced by James Stott & Co. (Engineers), Ltd., of Vernon Works, Oldham. The appliance consists of a rectangular steel plate tank with welded joints, the whole being thoroughly galvanized after manufacture. A heavy steel plate lid is provided stoutly hinged at the back of the tank, square section woven asbestos packing being used to form a perfect steam-tight joint with the tank. The hinged lid is efficiently counter-balanced by means of two uprights arranged at the back of the tank carrying a suitable counter-balance weight, operated by pulley and chain, the balance weight running on vertical guides. Underneath the lid is fitted a perforated galvanized plate in order that the clothing being decontaminated shall be kept totally immersed.

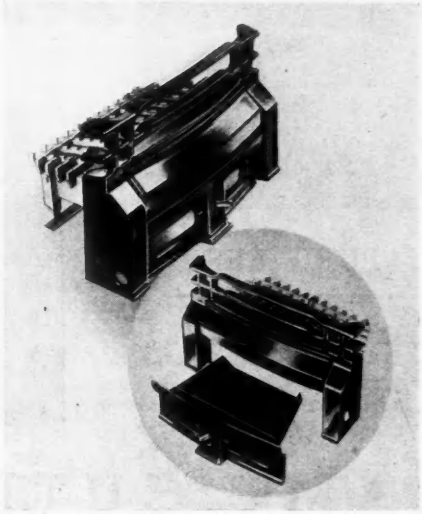
The heating medium consists of a number of burner rails with Bray No. 00's burners inserted, the whole being under the control of one master gas cock, and ignited by a safety pattern swinging pilot light. A heavy gauge steel skirting is fitted all round the tank in order to conserve and jacket the heat, the front and two sides being heavily insulated by asbestos millboard.

Mounted at the right-hand side of the tank is a large bore cold water feed valve, and fited at the bottom is a valve of sufficient size to empty the contents quickly. This valve is operated by an extended handle to obviate stooping. If an auxiliary hot water supply is available, it will be advantageous to use it, as this will considerably shorten the initial boiling up period, and at the same time conserve fuel. The tank capacity is 150 gallons, and the time taken to boil from cold is in the region of 1½ hours. Messrs. James Stott have full specifications of this apparatus available, which they will be pleased to send to anyone interested.

The Parkinson Coke Grate

The Parkinson gas-ignited coke grate, combining the labour-saving features of a gas fire with the cheerful appeal of an open coal fire, can be easily fitted into an existing surround, providing a most economical means of room heating. The use of fire-lighters and firewood is completely obviated, speedy ignition being obtained from the gas burner incorporated in the grate—just fill the grate with coke, light the gas, and in fifteen-twenty minutes the gas may be turned off, leaving a glowing fire that will remain bright for a considerable period without re-fuelling.

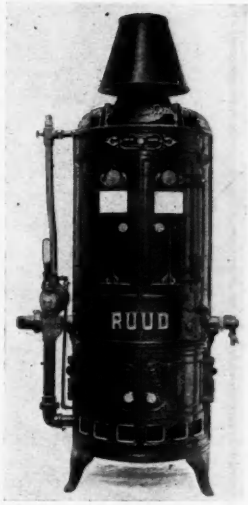
The rate of burning of the fuel is regulated by an air shutter which can be set to give the required heat output for the comfort of the occupants of the room. Not only is the Parkinson coke grate economical in use, but its cost is within the reach of every pocket. It is clean in use, and can be a means of saving in domestic expenditure, for a complete absence of soot avoids damage to interior decoration and furniture.



The Parkinson coke grate is strongly constructed, with a highly durable enamel finish. and bottom bars designed to give long and dependable service. The air regulator is simple in operation, and the ash pan is easily removable for cleaning

National Gas Water Heaters for War Office and A.R.P Requirements

The National Gas Water Heater Company, we are advised, are having considerable demands for their National-Ruud continuous flow heater. The type provides an instant, continuous, uninterrupted flow of uniformly heated water. The action is controlled entirely by the opening and closing of the hot water draw-off taps, and the heating action is instantaneous.

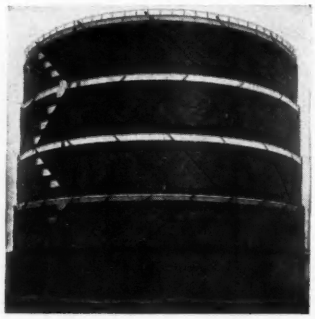


National Gas Water Heater

The system is a tankless one without stand-by losses and is suitable for all A.R.P. requirements where instant, inexhaustible, and rustfree hot water is desired. It is ideal for intermittent demands where storage of large quantities of hot water would be wasteful, and is specially adaptable for shower baths and for filling large baths where it is necessary to draw water over long periods that would exhaust storage supplies.

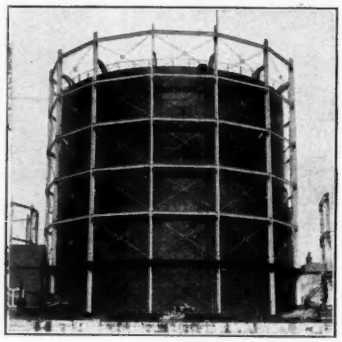
The National-Ruuds are extremely flexible, and when installed singly or in multiples of two or three and upwards, there are few, if any, hot water demands that it cannot meet. It is made in several sizes having outputs of from 5 to 10 gallons of hot water per minute. An important feature is the two separate and independent gas valves, one actuated by water flow and the other by water temperature, this latter control being by a thermostat in the heart of the heating zone which is instantly responsive to temperature changes. All water-ways are brass and copper, while the outer shell is of heavy cast-iron, insuring long life under heavy loads.

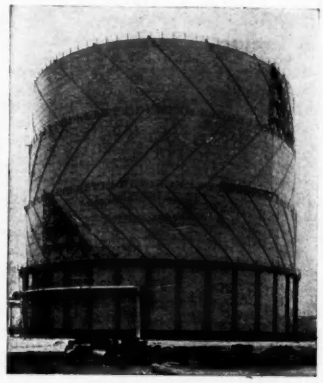
The heater is quite suitable for installation even in the open, and can be easily moved from place to place, wherever gas and water are available, while the dual gas control enables temperatures ranging up to 200°F. to be safely supplied if called for.



GASHOLDERS

GUIDE - FRAMED
SPIRAL
WATERLESS





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STEEL TANKS

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Telegrams : RETORTUS, SOWEST, LONDON

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Telephones : EAST 5231 and 5232
Telegrams : CUTLER, MILLWALL, LONDON

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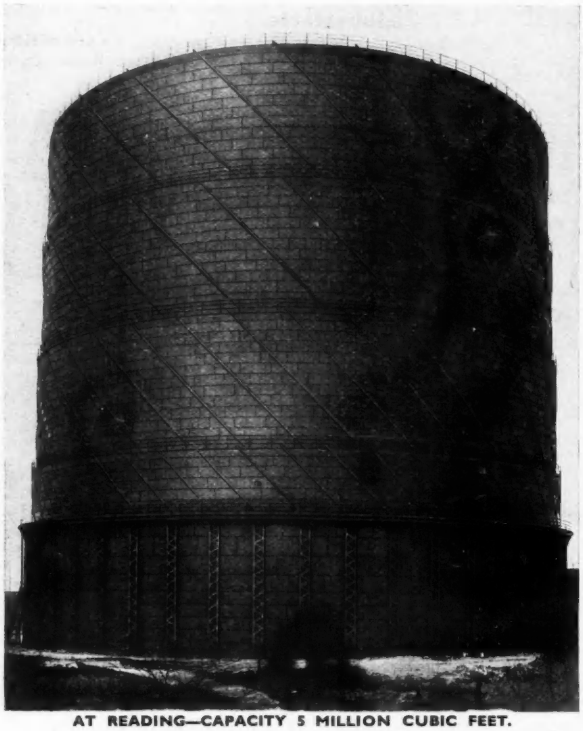

AT READING—CAPACITY 5 MILLION CUBIC FEET.

C. & W. WALKER

LIMITED.

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Nr. WELLINGTON—SHROPSHIRE
'Phone : Lilleshall-Shropshire Nos. 34 & 35 (2 lines).
'Grams : "Fortress," Donnington, Shropshire.

SPIRAL GASHOLDERS

DESIGN by Specialists.

MATERIALS of Best Quality.

CONSTRUCTION in our own Works, by Trained Workmen, Under Efficient Erectors.

ERECTION by Experienced Erectors.

Riveted or electrically welded.

LONDON OFFICE: - - REMOVED TO DONNINGTON.

Markets and Manufactures

Current Sales of Gas Products

The London Market

Oct. 23.

There are no changes to record in the values of tar products, which remain as follows:

Pitch 30s. per ton f.o.b.

Creosote about 5d. per gallon.

Refined tar 3¾d. to 4d.

Pure toluole is nominal at 2s. 6d. to 2s. 7d.

Pure Benzole about 1s. 9d.

95/160 solvent naphtha about 1s. 10d.

90/160 pyridine 14s. to 14s. 6d.

All per gallon naked.

Refined naphthalene crystals are about £15 per ton in bags.

All prices are *ex* makers' works.

The Provinces

Oct. 23.

Crude Gas-Works Tar, 10s. to 15s.

To avoid misunderstanding, it is necessary to state that the above price is not claimed to represent a market value. It is a price worked out from week to week upon a system which has been used for many years as a basis for the fixing of certain contracts for crude tar of varying qualities in different areas.

The average prices of gas-works products during the week were: Pitch—East Coast, 25s. to 27s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 25s. to 27s.* Toluole, naked, North, 1s. 10d. to 1s. 11d. Coal tar, crude naphtha, in bulk, North 7¾d. to 8¼d. Solvent naphtha, naked, North, 1s. 4¾d. to 1s. 5d. Heavy naphtha, North, 1s. 2¼d. to 1s. 3d. Creosote, *ex* works, in bulk, North, liquid and salty, 3⅞d. to 4¼d.; low gravity, 4d. to 4¼d. Carbolic acid, 60's, 1s. 7d. to 1s. 10d. Naphthalene, £13 10s. to £16. Salts, 70s. to 75s., bags included. Anthracene, "A" quality, 4¼d. to 4¾d. per minimum 40% purely nominal, "B" quality unsaleable. Heavy oil: Unfiltered anthracene oil, min. gr. 1,080, 4¾d. to 4⅞d.; filtered anthracene oil, min. gr. 1,080, 5¼d. to 5¾d.; heavy tar oil, gr. less than 1,080, 4¼d. to 4¾d.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls, whatever they may be.

Scotland

GLASGOW, Oct. 21.

A fairly steady throughput is being maintained in all but the heavy products, and prices continue firm.

Crude gas-works tar.—Actual value is round 30s. to 32s. per ton *ex* works in bulk.

Pitch of vertical quality is quoted freely at 24s. to 25s. per ton, f.o.b. for export, and round 20s. to 22s. 6d. per ton *ex* works in bulk for home trade.

Refined tar can be secured at 3¼d. to 4d. per gallon for delivery in the home market, while for export quotations are at 2¾d. to 3d. per gallon, into buyers' packages at makers' works.

Creosote oil.—Production is fairly well looked after with prices as follows: Specification oil, 4d. to 4½d. per gallon; low gravity, 4¾d. to 5¼d. per gallon; neutral oil, 4¼d. to 4¾d. per gallon; all *ex* works in bulk.

Cresylic acid.—Production is earmarked against existing contracts and spot lots are quoted at the following prices: Pale, 97/99%, 2s. to 2s. 3d. per gallon; Dark, 97/99%, 1s. 10d. to 2s. per gallon; Pale, 99/100%, 2s. 6d. to 2s. 9d. per gallon; all *ex* works in buyers' packages.

Crude naphtha is valued at about 5½d. to 6d. per gallon; *ex* works in bulk, according to quality.

Solvent naphtha is called 1s. 5½d. to 1s. 6½d. per gallon for 90/160 grade and 1s. 3d. to 1s. 4d. per gallon for 90/190 grade.

Motor Benzole remains at 1s. 3d. to 1s. 4d. per gallon.

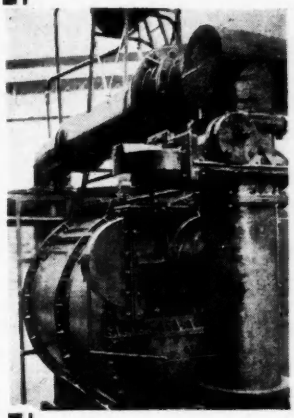
Pyridine.—Prices are nominal at 12s. to 13s. per gallon for 90/160 grade and 14s. to 15s. per gallon for 90/140 grade.

Head, Wrightson & Co., Ltd.

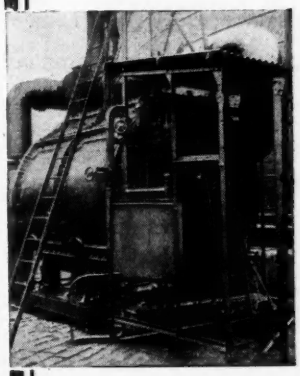
Head, Wrightson & Co., Ltd., Thornaby-on-Tees, announce that their London and Birmingham offices are carrying on, though skeleton staffs are retained. In the event of an extreme emergency, arrangements have been made for the London Office to be transferred to 47, The Green, Richmond, Surrey. Tel.: Richmond 0151, and the Birmingham Office to 12, Stoner Road, Hall Green, Birmingham.

Firms having evacuated London are reminded that the London Office is still in constant communication with the works at Thornaby-on-Tees, through the Teleprinter Service.

When a Joint leaks—



Permac Joints in a Gas Works



Permac Joints in a Gas Works.

Consider the loss in output while the plant is shut down and the joint is being re-made.

"Permac" the original Metal-to-Metal Jointing makes leak-proof joints that last till you want to break them down. Stands up to all temperatures and pressures. Equally successful on steam, gas, water, oil joints.

Send for particulars

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METAL-TO-METAL JOINTING MATERIAL

Sole manufacturers:—

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W E S T ' S

in Wartime

THROUGH the medium of our advertisements we offer this early indication of our policy in the light of existing conditions.

Our friends throughout the Gas Industry are assured that their interests will remain as important to this company as hitherto. Such interruption of normal industrial activities as must occur will not affect our desire to be consulted on all questions relating to the operation of West's Carbonizing Plants. We have complete confidence in the ability of these plants to meet the demands of the future, and a keen sense of the necessity to maintain them at a high level of efficiency. Our resources will be ready during the months ahead to assist the Gas Engineers in this vital responsibility whenever the occasion arises.

WEST'S CARBONIZING PLANTS

GLOVER-WEST VERTICAL RETORTS ● WEST VERTICAL CARBONIZING CHAMBERS

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GAS STOCKS AND SHARES

Despite the fact that all transactions are for cash, business on the Stock Exchange was more active in many sections last week than for some weeks past. This led to price increases which in turn brought about some profit-taking, and although this was enough to take the edge off the highest levels these generally were above those of a week ago. British Funds all rose above the fixed minima and in several instances the appreciations were considerable, while Dominion and Colonial stocks also shared in the advance. More attention was given to home rail stocks, while selective buying among industrials led to further improvements in this section. With the commodity market continuing firm, rubber shares made all-round gains, but oil shares slumped on the reduction in Trinidad Leaseholds dividend.

There were a few more transactions in the Gas Market last week, though the volume remains very much below the normal. The news of the partial relaxation of the Fuel and Lighting Restrictions Order came too late to have any effect on the market, and it will be interesting to see to what extent values will respond to the altered conditions. So far the marking down of prices appears to have been somewhat "panicky." For example, the South Metropolitan 6% preference stock, which ranks prior to nearly seven millions of ordinary stock, has fallen from 117½ to 90 since the outbreak of war, and at this price yields £6 13s. 4d.%. With a resumption of buying orders, however, prices generally should commence to move up. Evidence of this is seen in the continued improvement in Gas Light units, which advanced a further 2s. 6d. to 18s., which is only 9d. below the price on Sept. 1.

The heaviest drop last week in the Official List occurred in Portsmouth and Gosport consolidated with a fall of 22 points to 115, while most of the 5% preference issues in the List were lowered 10 points to 85. In the Provinces, the only fall of note was that of Liverpool ordinary, which closed 16 points lower at 95. Nominal quotations in the Supplementary List again remained unchanged.

Official Quotations on the London Stock Exchange

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Oct. 20.	Rise or Fall on Week.
1,767,439	Sept. 4	8	8	Alliance & Dublin Ord. ...	105—115	...
374,000	June 19	4	4	Do. 4 p.c. Deb. ...	80—90	...
877,576	May 8	5	5	Ascd. Gas & Water U'd'ts Ord.	15/—17/—	...
500,000	,,	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	18/6—20/6	...
535,545	,,	4	4	Do. 4 p.c. Red. Cum. Pref.	16/—18/—	...
318,730	,,	4	4	Do. 4 p.c. Irred. Cum. Pref.	15/—17/—	...
750,000	Sept. 18	3½	3½	Do. 3½ p.c. Red. Deb. ...	80—90	...
560,070	Aug. 21	7	7	Barnet Ord. 7 p.c.	110—130	...
300,000	Oct. 9	1/9⅔	1/4⅔	Bombay, Ltd.	18/—20/—*	...
181,185	Aug. 21	9½	9½	Bournemouth Sliding Scale ...	130—150	...
690,526	,,	7	7	Do. 7 p.c. max. ...	110—130	...
493,960	,,	6	6	Do. 6 p.c. Pref. ...	122—127	...
50,000	June 5	3	3	Do. 3 p.c. Deb. ...	70—75	...
362,025	,,	4	4	Do. 4 p.c. Deb. ...	93—98	...
335,000	,,	5	5	Do. 5 p.c. Deb. ...	110—115	...
357,900	Aug. 21	7½	7½	Brighton, &c., 6 p.c. Con. ...	107—117	–3
659,955	,,	6⅔	6⅔	Do. 5 p.c. Con. ...	100—105	...
205,500	,,	6	6	Do. 6 p.c. 'B' Pref. ...	95—105	–10½
855,000	Sept. 18	8	7	British Ord.	95—105	...
100,000	June 19	7	7	Do. 7 p.c. Pref. ...	136—141	...
350,000	,,	5½	5½	Do. 5½ p.c. 'B' Cum. Pref.	110—115	...
120,000	June 5	4	4	Do. 4 p.c. Red. Deb. ...	92—97	...
450,000	,,	5	5	Do. 5 p.c. Red. Deb. ...	100—105	...
450,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	89—94	...
100,000	22 May '33	6	4	Cape Town, Ltd.	¼—⅜	...
100,000	6 Nov. '33	4½	4½	Do. 4½ p.c. Pref.	¼—⅜	...
150,000	June 19	4½	4½	Do. 4½ p.c. Deb.	58—68	...
626,860	July 17	6	6	Cardiff Con. Ord.	95—105	...
237,860	June 5	5	5	Do. 5 p.c. Red. Deb. ...	102—107	...
98,936	Oct. 9	2/–	2/–	Colombo Ord.	1⅛—1⅜*	...
24,510	,,	1/4⅓	1/4⅓	Do. 7 p.c. Pref.	20/6—22/6*	...
739,453	Sept. 27	–/11.48	–/11.48	Colonial Gas Assn. Ltd. Ord. ...	15/6—17/6	...
296,144	,,	1/3.30	1/3.30	Do. 8 p.c. Pref.	20/6—22/6	...
1,775,005	July 31	4	4	Commercial Ord.	47—52	...
140,000	Aug. 21	4	4	Do. 4 p.c. Red. Pref. ...	90—95	...
620,000	June 5	3	3	Do. 3 p.c. Deb.	55—60	...
286,344	Aug. 21	5	5	Do. 5 p.c. Deb.	85—95	...
200,000	,,	3⅜	3⅜	Do. 3⅜ p.c. Red. Deb. ...	94— 99	...
807,560	July 31	7	7	Croydon sliding scale	100—110	...
644,590	,,	5	5	Do. max. div.	80—85	...
620,385	June 19	5	5	Do. 5 p.c. Deb.	90—100	...
208,660	Aug. 21	5	5	Dudley, Brierley Hill & Dist. Ord.	100—105	...
82,275	,,	5	5	Do. 5 p.c. Con. Pref. ...	80—85	+5
79,000	,,	3⅜	3⅜	Do. 3⅜ p.c. Red. Deb. ...	94—99	...
239,000	July 31	5	5	East Hull Ord. 5 p.c.	86—91	...
187,215	Aug. 21	6	5⅜	East Surrey Ord. 5 p.c. ...	98—103	...
176,211	June 5	5	5	Do. 5 p.c. Deb. ...	105—110	...
250,000	July 3	4	8	Gas Consolidation Ord. 'B' ...	18/6—20/6	...
250,000	May 22	4	4	Do. 4 p.c. Red. Cum. Pref.	17/—19/—	...
9,172,463	July 31	5⅜	5⅜	Gas Light & Coke Ord. ...	17/—19/–a	+2/6
2,600,000	,,	3½	3½	Do. 3½ p.c. max.	55—60	+2
4,477,106	,,	4	4	Do. 4 p.c. Con. Pref. ...	70—80	...
2,993,000	July 3	3⅜	3⅜	Do. 3⅜ p.c. Red. Pref. ...	80—85	–2½
8,602,497	May 22	3	3	Do. 3 p.c. Con. Deb. ...	58—63	...
3,642,770	,,	5	5	Do. 5 p.c. Red. Deb. ...	97—102	...
3,500,000	,,	4½	4½	Do. 4½ p.c. Red. Deb. ...	93—98	...
700,000	Sept. 4	3½	3½	Do. 3½ p.c. Red. Ded. ...	85—95	...
270,466	July 31	6	6	Harrogate New Cons.	95—100	...
157,500	Mar. 20	‡1/–	‡1/–	Hong Kong and China Ord. ...	⅛—¾	...
5,600,000	May 8	8	12	Imperial Continental Cap. ...	72—82	...
172,810	July 31	3½	3½	Do. 3½ p.c. Red. Deb. ...	85—95	...
63,480	June 19	3	3	Maidstone 3 p.c. Deb.	57—62	...
45,000	May 22	†10	†10	Malta & Mediterranean Metropolitan (of Melbourne) ...	95—105	...
392,000	Oct. 2	5½	5½	5½ p.c. Red. Deb.	95—100	...
231,977	Aug. 21	5	5	M.S. Utility 'C' Cons.	75—85	...
968,658	,,	4	4	Do. 4 p.c. Cons. Pref. ...	74—79	...
390,076	June 19	4	4	Do. 4 p.c. Deb. ...	88—93	...
148,955	June 19	5	5	M.S. Utility 5 p.c. Deb. ...	90—100	...
125,000	July 3	3½	3½	Do. 3½ p.c. Red. Bds. ...	92—95	...
675,000	May 8	†6	†3	Montevideo, Ltd.	52—62	...
250,000	Aug. 21	7½	7½	North Middlesex 6 p.c. Con. ...	133—138	...
396,160	July 31	5	5	Northampton 5 p.c. max. ...	101—106	...
300,000	April 24	†9	†7	Oriental, Ltd.	125—135	...
468,537	June 5	7	8	Plymouth & Stonehouse 5 p.c.	105—115	–4½
621,667	July 31	8¼	8⅛	Portsmouth & Gosport Cons.	110—120	22
241,446	,,	5	5	Do. 5 p.c. max.	95—100	...
73,350	,,	5	5	Do. 5 p.c. Pref.	80—90	–10
75,000	,,	4	4	Do. 4 p.c. Pref.	77—82	...
114,000	July 31	5	5	Preston 5 p.c. Pref. ...	90—100	...
247,966	June 19	4	4	Primitiva 4 p.c. Cons. Deb. ...	95—100	...
625,959	July 17	4	4	Do. 4 p.c. Red. Deb. ...	93—98	...
15,000	Sept. 4	6	6	San Paulo 6 p.c. Cum. Pref. ...	7½—8½	...
441,275	Oct. 9	1/1½	1/1½	Severn Val. Gas Cor. Ld. Ord.	16/—19/–*	...
460,810	Oct. 2	–/10⅜	–/10⅜	,, ,, 4½ p.c. Cum. Pref. ...	16/—18/—	...
133,201	Aug. 21	5	8½	Shrewsbury 5 p.c. Ord. ...	107—117	...
9,000	June 5	†4	†4	South African Ord.	4—5	...
1,996,297	Aug. 21	1/2⅜	1/2⅜	South East'n Gas Cn. Ld. Ord.	15/—17/—	1/
1,000,000	,,	–/10⅜	–/10⅜	Do. 4½ p.c. Red. Cum. Pref.	18/—20/—	...
769,191	,,	4	4	Do. 4 p.c. Cum. Pref. ...	15/—17/—	...
450,000	,,	4	4	Do. 4 p.c. Deb.	95—100	...
150,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—95	...
6,709,895	July 31	6	5	South Met. Ord.	55—65	...
1,135,812	,,	6	6	Do. 6 p.c. Irred. Pref. ...	85—95	...
850,000	,,	4	4	Do. 4 p.c. Irred. Pref. ...	70—80	...
1,895,445	June 19	3	3	Do. 3 p.c. Deb.	57—62	...
1,000,000	July 17	5	5	Do. 5 p.c. Red. Deb. ...	97—102	–½
600,000	,,	3⅜	3⅜	Do. 3⅜ p.c. Red. Deb. ...	92—97	...
1,543,795	July 31	6	6	South Suburban Ord. 5 p.c. ...	65—75	...
512,925	,,	5	5	Do. 5 p.c. Pref.	82—92	–8
500,000	,,	4	4	Do. 4 p.c. Pref.	75—85	...
250,000	,,	3⅜	3⅜	Do. 3⅜ p.c. Red. Pref. ...	89—94	...
888,587	June 5	5	5	Do. 5 p.c. Deb.	90—100	...
250,000	,,	4	4	Do. 4 p.c. Deb.	89—94	...
200,000	July 31	3	3½	Do. 3½ p.c. Red. Deb. ...	89—94	...
427,859	Sept. 18	1/2⅜	9⅜	S. Western Gas & Water Ord.	14/—16/—	...
160,523	Oct. 9	–/10⅜	–/10⅜	Do. 4½ p.c. Red. Cum. Pref.	17/6—19/6*	...
110,000	June 5	4	4	Do. 4 p.c. Red. Deb. ...	92—97	...
750,541	July 31	5½	5	Southampton Ord. 5 p.c. ...	75—85	...
148,836	June 5	4	4	Do. 4 p.c. Deb.	80— 90	...
350,000	July 31	5½	5½	Swansea 5½ p.c. Red. Pref. ...	90—100	...
200,000	June 19	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—100	...
1,076,490	July 31	6⅔	6½	Tottenham and District Ord....	85—95	...
409,835	,,	5½	5½	Do. 5½ p.c. Pref.	100—110	...
62,235	,,	5	5	Do. 5 p.c. Pref.	80—90	–10
453,380	June 19	4	4	Do. 4 p.c. Deb.	87—92	...
85,701	June 5	6	6	Tuscan 6 p.c. Red. Deb. ...	95—100	...
1,247,505	May 8	4	6	U. Kingdom Gas Cor. Ord. ...	14/—17/—	...
1,085,952	May 8	4½	4½	Do. 4½ p.c. 1st Cum. Pref. ...	14/—17/—	...
772,709	,,	4	4	Do. 4 p.c. 1st Red. Cum. Pf.	15/—18/—	...
745,263	June 5	4½	4½	Do. 4½ p.c. 2nd Non-Cum. Pf.	13/6—15/6	...
1,093,656	Sept 18	3½	3½	Do. 3½ p.c. Red. Deb. ...	85—95	...
378,106	Mar. 6	7	7	Uxbridge, &c., 5 p.c.	90—100	...
133,010	,,	5	5	Do. 5 p.c. Pref. ...	90—100	...
1,371,138	July 31	7	6½	Wandsworth Consolidated ...	85—95	...
2,525,768	,,	4	4	Do. 4 p.c. Pref.	65—75	...
1,343,964	June 19	5	5	Do. 5 p.c. Deb.	90—100	...
383,745	,,	4	4	Do. 4 p.c. Deb.	75—85	...
400,000	,,	3⅜	3⅜	Do. 3⅜ p.c. Red. Deb. ...	92—97	...
558,342	July 31	6⅜	6⅜	Watford and St. Albans Ord. ...	90—100	–5
200,000	,,	5	5	Do. 5 p.c. Pref.	80—90	–10
200,000	,,	5½	5½	Do. 5½ p.c. Pref.	100—110	...
200,000	,,	4	4	Do. 4 p.c. Rd. Pf. (1973/8)	90—95	...
100,000	—	—	—	Do. 4 p.c. Red. Pf. (1959)	97—102	...
200,000	June 19	4	4	Do. 4 p.c. Red. Deb. ...	95—100	...
200,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	83—88	...

a.—The quotation is per £1 of Stock. * Ex. Div. † Paid free of income-tax. ‡ For year. § Actual.

Supplementary List and Provincial Exchanges overleaf.

STOCK AND SHARE LIST—Contd.

Supplementary List, not Officially Quoted, London

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Nominal Quotations Oct. 20.	Rise or Fall on Week.
202,152	Sept. 4	5	5	Ascot Ord.	95—100	...
128,182	July 3	5	5	Do. 5 p.c. Pref.	101—106	...
31,035	Aug. 21	–/4⅜	–/4⅜	Associated Utilities 4 p.c. Pref.	15/—17/–	...
100,000	June 19	3½	3½	Do. 3½ p.c. Red. Deb. ...	93—98	...
17,000	Aug. 21	8	8	Bognor Orig. Ord. 'A' ...	137—147	...
62,210	,,	8	8	Do. New Add. 'A' ...	105—115	...
87,160	,,	7	7	Do. New 7 p.c. max. ...	100—110	...
37,440	July 31	10	10	Cam. Univ. & Town 10 p.c. max.	110—120	...
125,970	,,	7	7	Do. 7 p.c. max.	90—100	...
39,025	,,	5	5	Do. 5 p.c. max.	80—90	...
96,410	July 17	4½	4½	Cardiff 4½ p.c. Pref.	92—97	...
55,520	July 31	6	6	Colchester 6 p.c. Pref.	113—118	...
90,550	Sept. 18	5	5	Do. 5 p.c. Deb. ...	100—105	...
150,000	July 31	4	4	Croydon 4 p.c. Pref.	84—89	...
130,000	June 19	4	4	Do. 4 p.c. Deb.	90—95	...
65,000	Aug. 21	7½	7½	Eastbourne 'A' 5 p.c.	120—130	...
198,000	,,	6	6	Do. 'B' 3½ p.c.	103—113	...
112,312	,,	5	5	Do. 5 p.c. Pref.	100—105	...
130,000	June 19	5	5	Do. 5 p.c. Deb.	105—110	...
130,500	Aug. 10	7½	7½	Exeter New Ord. (£10) ...	13½—15½	...
24,000	Aug. 21	8½	8½	Gt. Yarmouth 8½ p.c. max. (£30)	24—29	...
59,400	,,	7½	7½	Do. 7½ p.c. max. (£30) ...	26—31	...
51,160	June 5	5½	5½	Do. 5½ p.c. Deb.	115—120	...
152,600	Sept. 4	9	8	Guildford Cons.	145—155	...
54,055	,,	5	5	Do. 5 p.c. Pref.	100—105	...
68,250	June 5	5	5	Do. 5 p.c. Deb.	103—108	...
156,660	Aug. 21	7	7	Hampton Court Cons. ...	100—110	...
86,046	June 19	‡4½	‡5	Holyh'd&N.W.G.&W.Cpn.Ord.	13/6—15/6	...
80,000	Aug. 21	4	4	Lea Bridge 4 p.c. Pref.	78—83	...
60,000	,,	6	6	Do. 6 p.c. Pref.	113—118	...
94,876	June 5	4	4	Do. 4 p.c. Deb.	87—92	...
73,620	Sept. 18	8¾	8¾	Luton Cons. 'A'	150—160	...
107,960	Sept. 18	5½	4	Mid Kent Ord. (£10)	8—9	...
230,940	July 31	10	10	Oxford & District Ord. ...	145—155	...
47,112	,,	5	5	Do. 5 p.c. Pref.	95—105	...
50,000	,,	6	6	Do. 6 p.c. Red. Pref. ...	106—111	...
126,193	May 8	7½	7½	Peterborough Ord.	134—139	..
64,990	Sept. 18	7½	7	Redditch Ord.	110—120	...
166,850	July 31	8	8	Romford Ord.	137—142	...
60,000	,,	4	4	Do. 4 p.c. Pref.	95—100	...
44,000	Sept. 18	5	5	Do. 5 p.c. Deb.	105—110	...
25,570	July 31	5¼	5½	Rugby 5½ p.c. Pref.	116—121	...
25,000	,,	6	6	Do. 6 p.c. Red. Pref. ...	103—108	...
42,750	June 5	5½	5½	Do. 5½ p.c. Deb.	113—118	...
110,950	Aug. 21	8	8	Ryde Ord.	137—147	...
270,086	Sept. 4	7	7	Slough Ord.	120—130	...
21,000	June 5	5	5	Do. 5 p.c. Deb.	103—108	...
28,872	May 8	5½	5½	S. Midland Gas Cpn. Ltd. Ord.	16/—18/–	...
28,866	Sept. 18	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	16/6—18/6	...
117,228	Aug. 21	7	5	Swindon Cons.	98—103	...
60,425	June 5	5	5	Do. 5 p.c. Deb.	103—108	...
64,380	June 19	5	5	Torquay & Paignton 5 p.c. Pref.	102—107	...
130,000	Aug. 21	8	5	Wakefield Ord.	101—106	...
81,650	,,	5	5	Do. 5 p.c. max.	81—86	...
82,000	July 31	6	6	Weymouth Ord.	101—106	...
273,626	Aug. 21	7	7	Wolverhampton Cons. Ord. ...	126—131	...
98,384	,,	6	6	Do. 6 p.c. Pref.	113—118	...
160,000	June 19	5½	5½	Do. 5½ p.c. Red. Deb. ...	102—107	...
106,490	Aug. 21	5½	5½	Wrexham Ord.	89—94	...
90,000	June 19	5	5	York 5 p.c. Red. Deb.	102—107	...
133,640	July 31	6½	6	Yorktown (Cam.) 5 p.c. Cons.	112—117	...
120,000	,,	5	5	Do. 5 p.c. Pref.	100—105	...
35,000	June 19	5½	5½	Do. 5½ p.c. Deb.	110—115	...

BRISTOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Oct. 20.	Rise or Fall on Week
347,756	July 31	6	5	Bath Cons.	107—112	...
1,667,250	,,	5	5	Bristol, 5 p.c. max.	97—101	...
120,420	June 5	4	4	Do. 1st 4 p.c. Deb.	89—93	...
415,250	,,	4	4	Do. 2nd 4 p.c. Deb. ...	89—93	...
328,790	,,	5	5	Do. 5 p.c. Deb.	104—109	...
274,000	July 31	5	5	Newport (Mon.) 5 p.c. max. ...	90—95	...
13,200	Sept. 4	8⅓	7	Pontyp'l Gas & W. 10 p.c. 'A'	12—13	...
13,600	,,	6	5	Do. 7 p.c. 'B'	10½—11	...
40,000	,,	6	5	Do. 7 p.c. 'C'	10½—11	...
140,778	July 31	5	5	Weston-super-Mare Cons. ...	93—98	...
64,338	June 19	4	4	Do. 4 p.c. Deb.	90—95	...
33,340	,,	7½	7½	Do. 7½ p.c. Deb.	140—150	...

LIVERPOOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Oct. 20.	Rise or Fall on Week
157,150	July 31	6½	5	Chester 5 p.c. Ord.	105—108	...
92,500	June 5	4	4	Do. 4 p.c. Pref.	85—90	...
36,430	,,	3½	3½	Do. 3½ p.c. Deb.	86—89	...
41,890	,,	4	4	Do. 4 p.c. Red. Deb. ...	96—100	...
2,167,410	Aug. 21	6	6	Liverpool 5 p.c. Ord.	90—100	–16
245,500	June 19	5	5	Do. 5 p.c. Red Pref. ...	100—105	...
306,083	July 17	4	4	Do. 4 p.c. Deb.	99—101	...
106,280	July 31	10	10	Preston 'A' 10 p.c.	174—184	...
188,219	,,	7	7	Do. 'B' 7 p.c.	126—136	...

NEWCASTLE EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Oct. 20.	Rise or Fall on Week
122,577	Aug. 21	8	8	Blyth 5 p.c. Ord.	146½—148½	...
732,000	Aug. 21	3	4	Hartlepool G. & W. Cn. & New	74½—76½	...
2,061,315	July 31	5⅔	5	Newcastle & Gateshead Con.	18/—20/–a	...
682,856	,,	4	4	Do. 4 p.c. Pref.	75—85	...
776,706	June 5	3½	3½	Do. 3½ p.c. Deb.	84—89	...
277,285	April 24	5	5	Do. 5 p.c. Deb. '43 ...	100—105	...
332,351	Aug. 21	6	6	Sunderland 6 p.c. max. ...	110—120	...

NOTTINGHAM EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Oct. 20.	Rise or Fall on Week
542,270	Aug. 10	9	6	Derby Con.	110—120	...
55,000	June 19	4	4	Do. 4 p.c. Deb.	100—105	...
20,000	June 19	5	5	Long Eaton 5 p.c. Pref. ...	9—11	...
80,000	,,	5	5	Do. 5 p.c. Deb. ...	100—105	...

SHEFFIELD EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Oct. 20.	Rise or Fall on Week
10,000	Aug. 21	10	10	Great Grimsby 'A' Ord. ...	180—190	...
6,500	,,	10	10	Do. 'B' Ord. ...	180—190	...
79,000	,,	10	10	Do. 'C' Ord. ...	175—185	...
1,806,339	Feb. 20	6½	6½	Sheffield Cons.	120—125	...
95,000	July 3	4	4	Do. 4 p.c. Deb.	99—101	...

a The quotation is per £1 of Stock.
* Ex. div. ‡ For year.

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